DOCUMENT RESUME

ED 284 556 IR 052 022

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TITLE Academic Library Reference Services.
PUB DATE [86]
NOTE 115p.
PUB TYPE Viewpoints (120) -- Reports - Descriptive (141)

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS *Academic Libraries; Higher Education; Library Administration; Library Automation; *Library Instruction; Library Personnel; Library Planning; *Library Services; *Online Searching; Program Evaluation; *Reference Services; User Needs (Information)

ABSTRACT

This examination of the philosophy and objectives of academic library reference services provides an overview of the major reference approaches to fulfilling the following primary objectives of reference services: (1) providing accurate answers to patrons' questions and/or helping patrons find sources to pursue their research needs; (2) building and maintaining a collection to accomplish the preceding objective; and (3) teaching effective research strategies and effective use of the library's collection. The philosophy and objectives of academic reference services are discussed; the user community is described; and approaches are considered for the organization and staffing of the reference department, teaching of library use, online access to information, communications and relations with other library departments, and evaluation and planning. Finally, a discussion of current themes and future trends considers problems of staffing and service effectiveness, the effects of microcomputers, the relationship between libraries and computer centers, the impact of compact disc technology, the concept of a "one-stop shopping center" for information, and the idea of librarians as database managers and/or information specialists. It is concluded that this is an explosive, expensive, and exciting time for reference services, with many difficult choices to be made. An extensive list of references is provided. (KM)

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ACADEMIC LIBRARY REFERENCE SERVICES

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ACADEMIC LIBRARY REFERENCE SERVICES

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I. Introduction

A. General considerations

Reference services are primarily responsible for providing functions related to finding information and using library collections. This may include reference desks, information desks, library use instruction, online access via intermediaries or end-user systems, building reference collections, etc. Sometimes government documents, interlibrary lending, periodicals and microforms, and other services and functions are aligned with reference. Differences can be found from library to library depending on history, administrative practices, building constraints and other variables.

The reference and/or information desks(s) may be considered the starting points for students doing papers or pursuing information for classroom or personal needs; graduate students working on coursework theses or dissertations; faculty pursuing their research interests or gathering information for their classes; and patrons of all types learning how to pursue both the new and the old, in a wide array of formats.

The quality and nature of reference services has a profound effect on overall patron perceptions of the library. The central points of reference/ information services mirror the visible attitude of library personnel and constitute a major element in opinions of library effectiveness. It is the location for "direct, personal assistance to readers seeking information,"[1] the functional location for information dissemination and learning the use of library resources for study and research. Thus, various services offered by reference departments reflect the programs related to access to

information in its many forms, the primary raison d'etre for libraries. These services depict the library as an active participant in academic educational processes.

B. Philosophy and objectives

The highest quality service possible to the user community (given available resources, staffing, etc.) should be delivered with patience, understanding, and empathy. Thus the philosophy of reference services is essentially an attitude. It is an attitude that excellent service to the patrons is the major priority. It is an attitude of teamwork to accomplish this service. It is an attitude that a variety of means for patrons to learn how to effectively and efficiently use a college or university library should be available. It is an attitude that manual and online approaches should be appropriately implemented to best fill the needs of the user community.

The level of reference service is bound by the particular academic environment. Service at a small undergraduate institution would be far less complex than at a typical comprehensive university with many various types and levels of students and faculty as well as potential demands from the surrounding community. Lyle points out that the new undergraduate needs a reference librarian for help and to "find the material he needs painlessly and informally" so that he "may accept the library as an integral part of his educational process."[2] Planning for a library reference service where one's only patrons are lower-division undergraduate students is quite different than planning reference services for 50,000 plus, potential patrons at a major university.

Unless financial and staff support are limitless, reference services will ultimately have to limit services and exclude some classes of services and/or patrons. With these limitations in mind, three primary objectives of reference services can be proposed:

a. Providing accurate answers to patrons questions (using online access when appropriate) and/or helping patrons find sources to pursue their research needs

b. Building and maintaining a collection to accomplish objective #1

c. Teaching effective research strategies and effective use of the library's collections

It is instructive to parallel these objectives with functions listed in the Reference Services and Libraries section of the Encyclopedia of Library and Information Science.[3]

1. Assistance and instruction (formal or informal) in the use of the library, including the location of materials, use of the catalog, and use of basic reference tools and sources such as indexes, dictionaries, etc.

2. Assistance in the identification and selection of books, journals, and other materials relevant to a particular informational need. This may be limited to assistance in the location of pertinent materials, or it may extend to the selection and evaluation of materials on a given topic.

3. Provision of brief, factual information of the "ready reference" variety, particularly such information as names, addresses, statistics, etc., that can be located quickly in a limited group of general reference sources.

An analysis of the user community will be followed by a brief overview of the major reference approaches to fulfill the above major objectives and serve the community.

1. User community

Many factors can contribute to the decision of who is to be served and at what level. The clientele of reference services can vary dramatically depending upon the location and philosophy of the library as well as the reference department. A small college library in a small college town will not be faced with the same potential patron pressures as would a comprehensive university in the middle of a major city. It is two different worlds. Reference desks which include a busy telephone reference service will find it difficult to differentiate between varying levels of patrons as well as quite cumbersome to attempt to give priority to a specific class of patrons, i.e. the individual in the library versus the telephone patron. Determining your clientele can be further complicated by special services. If the library is a government documents depository, it is obligated to serve a non-affiliated public. Online searching may only be offered to specific classes of patrons. Cooperative agreements with other academic institutions may greatly expand the pool of your potential users. Sometimes reference service patronage correspond completely with individuals who are affiliated with the academic institution or can acquire a user card. In other cases anyone can avail themselves of service at the reference desk. A good librarian at a busy reference desk might tend to give service first and perhaps ask questions later or never. A good librarian at a slow reference desk might feel rather foolish not providing reference service for anyone who could step foot in the library and ask for aid.

The reference policy should reflect this philosophy and clearly spell out who the patron community is and isn't and discern the levels of activity considered acceptable for each particular service. However, reference departments should guard against becoming overly rigid and punitive. If the internal policy is to look up three books at a time in the card catalog for each telephone reference call, the world will continue if four are looked up for an individual. If the internal policy is to only do quick reference online searches for students, faculty or administration, the walls will not come tumbling down if an outsider is the recipient of a search when the question warrants such an approach. One fear about written rules is that they can become counterproductive. They can get in the way of providing good service if they are taken too seriously. With good reason, most rules can be broken. It might be more appropriate to consider them as guidelines instead of rigid laws, in the pursuit of the deliverance of excellent service to the user community.

2. Overview of approaches to fulfill major objectives and serve the user community.

a) Providing accurate answers to patrons' questions: A reference desk or an array of reference and information desks should be designed and staffed to allow for optimum ability to answer patrons' questions. Limitations may have to be set on when professional reference librarians staff the public areas and even more drastically on when the desk may not be staffed at all. Although it would be ideal to have the most effective librarians at the desk every hour that the library is open, this is simply an impossibility. Thus it is important that the reference desk have a

built-in procedure for referral to an available librarian and even more directly to the proper subject-specialist librarian. Referral should not be considered a sign of weakness.

b) Building and maintaining a collection to accomplish objective #1: To answer questions precisely and quickly, the reference department must build and maintain an adequate collection of manual and online sources close at hand. materials should also be available to help identify collections, individuals, sources, etc. for referring patrons to other vehicles to fill their information needs. Good librarians are innovative and don't set many limits of how and where they will pursue answers. Yet librarians must learn to live within the confines of many potential limitations, e.g. inadequate reference collection budgets, supporting book and serial collections which may be uneven or sometimes non-existent in areas, unsystematic standing orders which lead to difficulties in keeping the most recent editions of needed tools on the shelf (particularly in libraries where budgetary constraints do not allow the initiation of new standing orders), interlibrary loan response time difficulties (particularly more pronounced in libraries more isolated geographically from other major research libraries), online access response time or down time problems, etc.

c) Teaching effective research strategies and effective use of the library's collections and online capabilities: In order to optimize service by not having to answer the same questions over and over again for every library user, in order to attempt to teach academic library users to become somewhat self-sufficient in performing minimally basic library research, in order to teach users

how to effectively find their way through the research maze and in order to educate the user about available online access, a multifaceted library instruction program is essential. Some of this instruction should take place during routine reference interactions, some should occur during more formal and systematic bibliographic instruction. Limitations may include the number and level of students that can be effectively reached depending on the size of the institution and the mode(s) of instruction pursued; the nature of instruction opportunities depending on the salesmanship of the librarian, the cooperation of the instructor, the mental set of the students, and the financial support of the program; the quality of the instruction depending on the abilities and innovativeness of the librarians; etc. This is an extremely complex issue, dependent on many controllable and uncontrollable factors. It is perhaps more complicated than necessary because of the overwhelming literature on the subject. The wheel is forever reinvented.

These three objectives will be treated in more detail below as we explore the organization, staffing, policies and procedures of reference services (including reference collections); teaching of library use and online access to information.

II. Organization and staffing

Successful reference service depends upon four essential elements: 1) a well-trained staff with a positive service-oriented attitude, 2) logically arranged work areas, 3) well-planned, clearly defined policies and procedures, 4) logically arranged points of service, and 5) reference collections which serve the needs of the

academic community. The following five sections will treat these elements.

A. Staffing considerations

A good reference librarian has to be energetic, scholarly, persistent, patient and imaginative. Energy is essential to hold up during long hours at a busy reference desk. A scholarly nature is a strong asset. One must display the ability to keep on learning. Broad knowledge of many subject areas as well as in-depth knowledge of specific areas can allow for the ability to understand and field a broad array of questions as well as function as a specialist. Persistence and patience are crucial because reference interview can be time consuming and require a special kind of understanding to accurately ascertain the specific needs of a patron. Also, despite the recent literature which essentially points to a magic five minute point of no return after which time spent on reference questions is not time well spent,[4] many questions are successfully resolved after considerable thought and many different strategic attempts. A good imagination is required for many of these attempts. Librarians must often be innovative in order to apply their knowledge of sources and strategies to come up with working approaches to solve queries, particularly with the advent of ready reference online access at many institutions. Since librarianship is not high paying, love for library work may also be an element of a librarian's personality.

There are many other analyses in the literature treating the qualities necessary for academic librarianship. For example, Battin proposes four qualifications: the ability to solve problems, a solid

undergraduate preparation, ability to manage, and an intellectual commitment to the field.[5]

B. Office considerations

The varying functions of reference departments in academic libraries determine the administration and housing of the service. The services encompassing reference can vary from institution to institution depending upon overall library structure and philosophy. Many reference departments minimally occupy three areas: 1) a reference office or suite of offices, 2) a reference desk or service area adjacent to 3) the reference collection. Other potential areas may include rooms for instruction and online searching, an information desk at a central location, and a card catalog assistance desk adjacent to the catalog area. As other functions are aligned with reference, additional space and staff needs are added. The reference office typically houses librarians and support staff as well as work and meeting areas. Librarians' office arrangements can range from many desks in one room to many variations of landscape architecture to distinct office space for each reference librarian. What is crucial is that the arrangement allow for effective communications between staff members as well as the ability to work with patrons and colleagues with some degree of privacy. Reference office space should be separate but convenient to the major reference service point because the success of reference services often hinges on effective referral and cooperation in answering queries. Telephone access from the reference service point to the reference

office and ideally to each librarian's office is particularly desirable.

Typically reference librarians serve a scheduled number of hours at the reference desk and may also be responsible for library instruction, online searching, collection development and liaison activities in specific subject areas and/or for specific academic departments. Other special duties may be added, e.g. time at information, card catalog or other service desks; map files; vertical files; ready reference sections; coordination of other specialized reference collections; mail and/or extended reference questions; etc. Thus the responsibilities of each reference librarian can be quite diverse and complex. Overall effectiveness can be somewhat dependent on the quality of space and housing that allows for good organization, the ability to spread out work that remains secure when job duties take the librarian elsewhere, and the ability to concentrate. Generally good time management principles and effective juggling of many responsibilities require quiet time periods where interruptions are kept to a minimum. This influences office space requirements.

C. Policies and procedures

Various modes for cooperation and referral, in-house reference approaches, new research tools and techniques, and other information to help library staff provide effective service should be communicated both on a daily basis as well as in a vehicle that collects and organizes policies. A continuously revised reference manual (although not a massive overwhelming or debilitating treatise)

is an important element in continuously effective service. This manual should elaborate on purposes, reference philosophies, organization, specific guidelines, ethics, statistics, policies, procedures, useful bibliographies and other handouts, etc. It should be used for the orientation of new staff members as well as a basis for departmental policy. A great help for formulating such polices is Katz and Clifford's handbook,[6] which contains ideas about all aspects of reference services including sample policies regarding user categories, reference desk policies, online services, instruction, ethics, etc. Some individuals are opposed to lengthy and detailed reference policies and procedure statements and believe them to be too confining and limited as well as difficult to produce to everyone's satisfaction. Perhaps a happy medium of concise statements is the direction to pursue. Suffice it to say there are many effective reference services without extensive written policies. In support of reference service policies, Easley elaborates reasons for their development including the establishment of standards of service, assisting in-training of new staff, establishment of levels and limits of service, establishment of priorities of service, and description of practical procedures that answer practical questions.[7]

An essential supplement to a manual or organized collection of policies is some type of daily updating mechanism to communicate new information, problems which may arise, procedural adjustments, assignments which will be impacting on the reference desk service, new sources, etc. An "Updater" (notebook or clipboard) can be considered required reading for any staff member with any kind of public contact. The goal of these kinds of vehicles is to make

certain that everyone is aware of responsibilities with the public and has the same information so that service remains consistent and accurate.

Other potential ideas for reference administrators to consider for creating even reference service are offered by Batt.[8] With many individual differences in ability, training and experience; with many libraries fraught with built-in frustrations (e.g. lines at service points, periodical cuts, lack of multiple copies of desired books, poor assignments, reserve restrictions, theft and mutilation, malfunctioning copy machines, etc.); and given the poor performance and low accuracy rates evident in many unobtrusive testing studies of reference desks;[9] he offers an array of activities and strategies which can potentially build in some quality control and decrease some of these frustrations. Reference administrators could consider some of these ideas and modify others to improve the quality of reference service by improving both the physical and psychological environment. Other contributions to the same "Conflicts" issues of The Reference Librarian[10] offer advice for service improvement.

Two other administrative factors should also be mentioned. Firstly, to assure that staff at all levels understand their responsibilities, position descriptions should be maintained and reinforced. Secondly, to allow librarians to use their time well and be productive, an array of support staff ranging from student assistants to skilled classified staff should be trained and available. In some libraries, support staff are trained for specific functions for the whole department; in other situations support staff are assigned to specific librarians. Some of the functions include

typing, filling out orders, card catalog searching, card catalog filing and revision, online search statistics and billing, information desk work, reference desk backup, shelving, ongoing inventory projects, checking in books and serials, reference collection maintenance, and a variety of other tasks in support of reference services. The more effectively librarians can delegate clerical and routine tasks, the more time available for professional level activities, and hopefully better reference support of the academic community. Reference departments fortunate enough to be near a graduate library school can attempt to arrange for graduate assistants or internships in order to benefit from a higher level of student assistant support as well as provide valuable experiences for future librarians.

D. Service points

1. Physical arrangment. Academic library reference desks range from a desk or two or three to a wide array of styles of counters over which reference transactions take place. Some reference staff prefer desks which allow for a more individualized approach as well as for the ability of a patron to sit down next to the staff member. They perceive counters as barriers to service. Other reference staff feel more in control and organized in a reference counter environment. Some librarians believe that their best work occurs when they leave the desk area and pursue patrons in need wherever they are working.

Usually quick reference shelves or areas are built into the reference transaction area to house tools in support of quick reference questions, specific assignments, as well as to maintain reference tools that are too valuable or too frequently consulted to be shelved without some kind of special control (often the holding of an ID). Typical quick reference tools are almanacs, statistical sources, major directories, major handbooks, selected style guides, internal card files, locally produced bibliographies and other guides, assignment files, sources such as "Where to Find What . . . " or "Information America"[11] and many other tools endemic to the particular library and reflecting repeatable questions that come to the particular reference desk. Some libraries tend towards small quick or ready reference collections, others rely on something more extensive. In any case, it is essential that patrons looking for these tools are referred to the desk area, usually by a "dummy" on the regular reference shelf location. Functional quick reference

collections are not static. Sources are always being added and removed to reflect ever changing demands on the desk, new questions in vogue, etc.

The reference collection itself may range from a few thousand volumes to tens of thousands of volumes depending on the arrangement and philosophy of the library. The reference collection will be treated in more depth in the next section.

2. Staffing. Staffing of reference desks vary dramatically from library to library, again depending on the location, population, philosophy, monetary constraints, etc. For example, there are academic libraries where there is no reference service offered during some hours the library remains open. There are other academic libraries that staff the reference desk primarily with nonprofessional individuals who are trained to refer appropriate questions to librarians either via immediate referral or by appointment. University of Michigan's Graduate Library General Reference Desk is staffed with Technical Library Assistants (paraprofessionals backed up by library school students). Librarians are scheduled approximately ten hours per week of back-up (on call and summoned by beepers). These are two extremes, each with potential difficulties. Many reference heads would agree that they prefer to have reference librarians at the reference desk for all open hours. The need for double and even triple staffing during some hours, the fact that the time of many reference librarians is spread over an array of time consuming and challenging duties as well as meetings, and the frequent limitations of staff sizes, often make it essential to utilize trained classified staff and even graduate

students as reference desks backups during some scheduled hours. These individuals should experience rigorous and ongoing training, careful observation, scheduling with a variety of professionals, and most importantly a realization that answering questions only when you are certain of being correct (using reliable sources) is a sign of strength, not weakness. Otherwise questions should be referred to the appropriate librarian. It is the only approach.

3. Telephone reference and information desks. Telephone service is a common occurrence at most reference desks. Thus reference desk workers may require a policy which explicitly spells out the relative priority of the patron at hand versus the telephone caller; the degree and depth of reference service allowed to each category of patron; and procedural guidelines regarding how to handle one type of patron over the other, e.g. procedures for putting patrons on hold, taking messages, calling back patrons, systematically transferring incompleted reference questions to the next staff member on duty without repetition of effort, etc. Again the Katz and Clifford handbook is a marvelous tool for ascertaining what is done in a variety of libraries.

Some libraries use an information desk which screens telephone calls and/or in-persons patrons and refers only those needing reference service to the reference desk. Occasionally some semblance of a quick reference collection is housed at these locations. Usually the primary function of the information desk is to screen purely locational and routine information and referral questions. Often this screening function is combined with a card catalog assistance function, with this public service area housed near the

card catalog. Some libraries have a card catalog assistance desk as a completely distinct function from other reference areas. In these situations, good communications between service areas and joint planning are essential to offer a systematic service. The advent of online catalogs create a profound effect on the need or lack of a need for a card catalog assistance area depending on the type of system, policies regarding the card catalog, and the nature of the back-up system, if any. Also the location of the catalog with respect to the reference desk impacts on the need of a separate public service area near the catalog. These special desks, e.g. information and card catalog, if they exist, may be under the administration of the reference department, or may be staffed by individuals from other library departments. Some libraries only use information desks as temporary screening devises during peak times, e.g. the first few weeks of a semester. This approach can be quite successful in taking the burden of repetitive directional questions away from the reference desk and results in more optimum use of librarians' time.

4. Divisional systems. It should be noted that some libraries maintain a divisional system, with separate reference areas and reference services in an array of broad subjects, e.g. humanities, social sciences, science and technology, fine arts, etc. How the library is divided in this fashion can be as much historical as logical. In divisional systems patrons receive the benefits of more potential individualized attention and in-depth service by the subject specialist(s). However this is at the expense of duplication of tools as well as inconveniences with interdisciplinary topics. In

addition, it is far more expensive and difficult to adequately staff a group of reference desks throughout the library than just one main desk. With the financial restraints of the last decade, some divided collections have been centralized. The existence of branch libraries also effects many aspects of reference service, e.g. duplication of sources, gaps in librarians' working knowledge of collections, effective referrals, etc. Branch libraries are treated in depth in a separate chapter.

The trend towards centralization may be turning around. Two recent examples are the late Hugh Atkinson's applications at Illinois and Martell's proposals. Both of these concepts would have profound effects on how reference services would function as well as on job descriptions of libraries. Atkinson believes that the ideal situation is a library nit with "one or two librarians, one or two library clerks, a handful of student assistants, a homogeneous identifiable clientele, and a collection large enough to suit that clientele."[12] A larger library would essentially be a collection of these smaller units. Martell's plan for restructuring involves small client-centered work groups with individual librarians performing many functions, e.g. reference, collection development, cataloging, etc. Martell see this system as more responsive to users' needs as each client-centered group of librarians would be "at all points where the library interacts with its user groups."[13] Both Martell's and Atkinson's concepts would involve obvious administrative challenges. For one, many librarians would have to progress a long way to be willing and able to participate in aspects of both traditional , technical and public service activities. For example,

some reference librarians consider cataloging as the other end of the world, i.e. something foreign. Some catalogers would never even get near a reference desk. It appears inevitable, however, that automation brings technical and public services closer together. Radical changes from the traditional centralized system or even from the traditional divisional public service setup may look more and more palatable as the years go by. Some library futurists predict increased demands on the academic librarian with broader overall responsibilities within one's subject area. Reference service would be the responsibility of all librarians in the unit. Librarians would be multifaceted in their knowledge of library science as well as their subject area. Cline and Sinnott believe that most librarians would work in only one subject field in the course of a career.[14] One could imagine that the level and accuracy of reference service would increase in this type of work environment. One might also envision the concept of faculty status for librarians fitting more comfortably in this specialized situation.

5. The end result. No matter what the organization and staffing of the reference desk, the key is the attitude behind it. Ineffective service cannot be saved by a particular structure of reference desk or a specific collection of reference tools. Good service can occur despite shortcomings in the arrangement and collections. Library staff who realize that saying "no" is a rare occurrence is one key to service that excels. There is always another source, individual, special collection, etc. to consult when the limits of one's own resources have been reached. For example, Research Library Group (RLG) libraries can use the reference liaison

system (i.e. communicating with other libraries via an online message system using RLIN terminals) as a tool for asking major research libraries or specialized collections to tackle a difficult or dead-end question. Also, the telephone is a very powerful reference tool. The worst case should minimally provide the patron with a logical referral.

Prior to referral, one should be certain that one has uncovered the root of the question. Strategies for reference interviews are available throughout the library literature. Katz provides particularly succinct analysis of the art of the reference interview, the reference search and levels of reference service.[15]

What reference administrators want in the end are well trained reference personnel displaying patience, empathy and other positive service attributes, working at logically arranged reference points chock full of wonderful reference tools (which are treated in the next section). This is an ongoing process, but one where positive results can ultimately be attained in all academic libraries.

E. Reference collections

Although the major reference collection tools found in academic libraries are fairly standard (selectors generally use the same tools and reviews for their reference collection materials selection), many individual differences in content and organization exist. Generally reference books can be defined as items which are kept for reference only, are not allowed to be used outside the building, and are compiled to supply definite pieces of information of varying extent, and intended to be referred to rather than read through.[16]

Indexes and abstracts may be integrated with other reference tools (general and specialized dictionaries, encyclopedias, handbooks, almanacs, directories, atlases, yearbooks, gazeteers, concordances, biographical tools, statistical sources, bibliographics, etc.) or may be kept in a separate section. The separate section approach allows for an identifiable area of the library's collection which provides access to periodicals. Indexes to the library's collection which provides access to periodicals. Indexes to newspapers may be integrated with other indexes or kept in the newspaper of microforms areas. Indexes on computer output microfiche (COM) may be maintained in the index and abstract area, periodical and newspaper area or both. If indexes and abstracts are kept in a distinct area, they may be arranged by classification number (thus arranging them in a general subject sequence), or they may be placed on tables by broad subject areas, e.g. education, history, general, etc. If this approach is taken, an alphabetical list of indexes noting table locations should be readily available. The size of the index and abstract area as well as the nature of the

primary users somewhat dictates the organization. Some libraries only keep recent years of indexes and abstracts on the major shelves or tables and place older years on supporting shelves nearby or even sends them to the stacks. Other libraries do not split runs of indexes and abstracts. Again special considerations as well as the nature of local use help dictate these decisions.

Along the same lines, some libraries only keep the most recent edition of reference tools on the reference shelves and relegate older editions to the stacks and/or non-circulation designations. Libraries consider how many years and/or editions of a tool to keep in reference on a case by case basis depending on needs for back ups, nature of use, types of assignments, distance of stacks from reference area, size of collection, etc. Also, what may be thought of as a reference tool at one library may not be considered as such at another depending on philosophy. For example, some believe that certain handbooks should be circulated for use, others place them in reference. some libraries place every bibliography on the reference area, others are quite selective and place most specialized bibliographies in the circulating collection or a non-circulating designation in the stacks.

Generally the reference collection size and scope correlates with the library size. Although these collections primarily have a goal of supporting the curriculum, they typically also support information needs beyond the classroom and represent virtually all areas of knowledge. The depth of specific areas within the reference collection generally depends on the availability of nearby special and branch libraries. If there is an available law school library

down the block, only a few major reference tools on law may be collected. If the library system has a chemistry branch, the main reference collection would not be set up to handle in-depth chemistry questions.

There are many reasons for keeping the reference collection a manageable size, among them to avoid overwhelming and confusing patrons, to increase the ease of providing service from a carefully selected group of the most useful reference tools (i.e. it is easier to maintain control of a smaller collection), as well as space limitations which occur in most reference areas. An ongoing evaluation, inventory and weeding or deselection system is essential for recognizing gaps in the collection, determining missing reference tools, and identifying items in the collection which no longer have enough reference value. It is important to note that the reference collection is not static. It is part of the total information available in the library and is separate from other collections because of the nature of its use. Yet the reference collection should be in a state of flux, modified and evolving from the feedback of its daily use and built on the principles of constantly evolving reference collection development statements. Engeldinger notes that relatively little formal attention is given to the role and importance of reference collection weeding. He believes that "if the needs of our clientele are to be served, more energy and attention may have to be devoted to keeping the collection viable and pertinent. This is especially difficult at a time of reduced budgets and increased demands for service."[17]

Generally the overall responsibility for building and maintaining the reference collection lies with the reference head, often with some of the tasks delegated to an assistant head and/or librarians. Input for building the collection may come from subject specialist librarians as well as faculty and other patrons. The more standing orders which can be set up for essential reference tools, the easier the overall task becomes. A library with frozen or inadequate standing order budgets can create severe frustrations for reference collection builders. Books coming in on approval plans as well as gifts should be reviewed for potential reference inclusion, in fact it is a good idea for all books coming through the system to be reviewed for reference value prior to cataloging. Many sources of information are available to aid reference collection development including: salespeople who barrage reference departments daily with a variety of techniques to try to get a commitment, an item in the mail with a bill, or minimally send you additional information about a reference tool that your library simply cannot survive without; flyers about reference sources which routinely fill up your mailbox, sometimes with duplicates and triplicates or worse; review sources such as RSR, College and Research Libraries, Library Journal, Wilson Library Bulletin, Choice, RQ, etc.; and the many traditional reference tools which help build reference collections.[18]

Reference collections also may include non-book materials. Microfiche reference sets such as PHONEFICHE (telephone directories on microfiche), BIOBASE (an index of major biographical reference tools arranged by person), college catalogs on fiche, etc. are often

most effectively used in the reference area. Either a centralized reference non-book area can be considered or the reference non-book sets can be spread about the area by function, form and subject. Also vertical and other files may be part of the reference collections, e.g. pamphlets, maps, career materials, annual reports, etc.

Since reference books generally do not circulate (they are there to be consulted and should be available at all times) it is important to maintain a reliable and fast system of reshelving. A temporary area for reference books to be reshelved sometimes helps the process and gives patrons and staff a place to check for unavailable reference tools. Any special circulation of reference tools should be for excellent reasons and for as short a time period as possible. For ease of patron and librarian access, a reference card catalog (author, title and subject) should be located near the reference desk or available on a nearby online terminal.

III. Teaching of library use

A. General considerations

Bibliographic instruction (BI) (also called library instruction, library use instruction, user education, etc.) became a major program in most academic libraries around the late 1960's and early 1970 even though its roots can be traced approximately seventy years earlier. BI around 1970 was geared to the freshman or new student and focused primarily on orientation to the library and the use of basic research tools. As we shall see below, BI has evolved into a far more complex concept since that time, growing and changing with new modes of information and technologies. Yet ironically, it has not been given much weight in graduate library school programs. Although a few lucky students manage to experience internships or preprofessional positions with competent BI librarians, only a few library schools actually offer specific coursework on BI. Most library schools instead incorporate BI into existing curricula, if at all.

BI programs have the potential to be important and helpful. Such efforts can have a positive impact on the retention of students. Librarians often view students when they are on their own, floundering with an assignment, or frustrated. Some students approach the reference desk looking more for counseling than reference aid. Their study and research skills are lacking and library personnel can often provide positive aid beyond what is traditionally considered reference aid, even if it only referral to a tutor or an academic program or advisor. Librarians can also offer specialized programs geared to the needs of these high-risk students. "Group and individual library programs can make a strong contribution

to the overall success of a student and ultimately affect dropout rates."[19]

Computers, advances in telecommunications and other technological changes have dramatically impacted on most library functions. Reference services have been affected by use of computers as part of instructional endeavors; by almost instantaneous access to many hundreds of diverse databases; by use of national databases for routine reference services such as verification, locations for items not in one's own library, Boolean access to millions of books, records, scores, manuscripts, periodicals; by use of computers to provide access to one's own collections; by the use of microcomputer/laser disk based systems such as InfoTrac (Information Access Corporation) where patron search and print citations on their own; by the use of microcomputers to create internal databases, ease the time commitments needed for routine duties, word processing, more effective and efficient online searching, etc.; and by access to other recent new approaches for the storage of information (i.e. CD-ROM technology). This impacts of bibliographic instruction in that librarians have so much more to convey, i.e. how to survive in a library where paper and online access coexist. Instruction is complicated by a time when libraries are being "reinvented in the electronic environment."[20]

The library instruction literature has reinvented the wheel thousands of times. Even the editor of a 1979 bibliography on library instruction points out the redundancy of much of the materials, a lack of conceptual framework, and an abundance of "how-to" articles.[21] Perhaps this is because BI is so obvious.

Anyone with experience at a busy reference desk would quickly realize the need for various approaches toward mass education. However, the BI literature in the last few years seems to be at a much higher level, perhaps mimicking the improvements in research techniques. Also, perhaps enough librarians have been performing BI long enough and attended enough BI workshops and conferences to be able to step back and analyze what they are doing, what they are not doing, and how they can improve on the multitude of approaches considered within the broad spectrum of BI. The new wave of BI literature involves theoretical frameworks,[22] critical thinking,[23] a holistic approach,[24] cognitive learning theory model applications,[25] instructional objectives for teaching patrons about online systems,[26] many excellent recent articles treating computer-assisted-instruction (CAI) and innovative approaches to using software to assist BI, etc. The future is promising.

B. BI techniques and levels

Articles abound on the advantages and disadvantages of the many approaches and levels of BI, ranging from the straightforward orientations to sessions for incoming freshman to seminars for doctoral level students desiring to sort out the advantages of various approaches of online access and determine the appropriate areas where manual searching is still advisable or necessary.

Most libraries offer an array of BI approaches, attempting to reach as many library users as possible via a variety of means. No one technique provides all of the answers. some can create confusion (e.g. the rapid-fire show-and-tell of many reference tools); some create boredom (e.g. the out-of- library classroom lectures to

students with no obvious or immediate vested interest or reason to pursue the material); some may go one step too far (e.g. a required three credit course for freshman that approximates a library school reference course). Despite all of the available instructional modes and applications of technology to learning procedures, many librarians remain old- fashion. They still perceive the value of a competent librarian interacting with a group in the library. This allows the motivation to provide human contact and gear the presentation to specific needs and questions. One can understand why Casbon desires "to communicate enthusiasm for potential assistance the library and its resources can offer and to let the students know of the existence of the Reference Department and the librarians' willingness to help." To fulfill these goals she believes the lecture method is best if the librarian has the right personality and style to communicate these ideas.[27]

What follows below are short descriptions of some of the typical BI approaches.

Tours - - - this is a logical approach to orient a group to the library facilities. Sometimes tours are expanded to include instruction to the use of specific tools such as the card catalog or considerations of research strategies. The larger the group, the more cumbersome it will be to provide any kind of useful instruction "on the run." Often tours are used to reinforce locations of items and major points made in a n immediately previous sit-down session dealing with research sources and strategies. Such a tour provides a vehicle for important repetition. Other varieties of tours include the round-robin approach (groups cycled around a variety of

stations); general open tours that can be modified to fit the needs of individuals attending; tours for campus visitors such as prior to football games or for visiting high school groups during recruitment attempts.

Note here the ever present dichotomy between orientation and instruction. Many tours are just considered part of an orientation program. Many tours are tied together with instruction. Generally orientation has different purposes than instruction, e.g. location of services, study areas, library guides, smoking areas, best places to socialize, etc. Orientation should never be considered a primary vehicle for learning research strategies and sources.

Instruction as part of a specific lower-division course - - - A common approach in most libraries, one or two instruction sessions are built into the course, typically Freshman English or Speech. Sometimes this is mandated and all sections of the course participate; sometimes this is voluntary and students will receive this instruction only if they get the right (or wrong) instructor. This type of instruction if most effective if it also involves a well thought-out assignment or a paper that requires research in a variety of tools and with logical research strategies. One problem with this mode as the major approach to instruction is reaching students who might test out of the course or recently transferred to the university or college and does not require the targeted course.

Course-related instruction - - - This approach provides students with instruction for locating information and research strategies to meet course requirements. The previously mentioned instruction attached to a targeted course usually fits these criteria.

Course-integrated instruction - - - This approach essentially goes one step further and involves library instruction that is a necessary part of the course. Farber's total integration at Earlham[28] is an example. The integrated model is labor and cost intensive and involves extensive coordination, scheduling and materials development. Dependence is high on the teaching faculty. Carlson and Miller note these and other potential problems.[29]

Term paper clinics - - - This approach provides individual help to students at a time when they really need it. Good PR, proper timing and enough participating librarians to offer one-on-one assistance are essential for this approach to success. Bergen and MacAdam offer an analysis of the state of this art and believe that academic institutions might "consider such a program even in libraries faced with hard choices in professional resource allocation."[30]

Slide-tape presentations - - - This approach can take some of the pressure of repetition off of librarians and is potentially effective for groups or individuals in and out of the library. Preparation is time consuming and the potential exists for slide-tapes to go out of date. I've heard many a librarian report that they grew tired of the approach and hearing the same presentation over and over again. Some actually then adapted the slides to their own verbal presentations and eventually let the slides drop off as they approach their previous method of presenting a lecture. Although some writers cannot believe that a slide-tape can replace a reference librarian, this approach has been

successfully implemented at many institutions, particularly as a supplement to other programs.

Library guides - - - These are essential for providing relevant information to library users on general information, finding books, using indexes and abstracts, locating periodicals, consulting government documents, using microforms, etc. Library guides can be used in conjunction with most other BI approaches.

Signs and point of use instruction - - - Good signs can alleviate much potential patron frustration. Instruction on how to use a source kept adjacent to the source, whether published, online or handmade, can also assist patrons when they require aid. Patrons should also be made aware of instructions already available within most information tools.

Faculty instruction - - - Faculty may desire instruction on new technologies and approaches. They also may be receptive to instruction to help them provide their own BI. McCarthy offers an excellent analysis of the faculty problem and the potential for faculty instruction.[31]

Self-guided tours - - - This approach can serve as an adequate source of information for the motivated. Some question whether degree of use warrants the preparation involved.

Workbooks - - - This common approach is usually self-paced and provides a vehicle to reach a large number of students in an active learning situation. Workbooks are often applied in conjunction with a course or other BI vehicles.

Programmed texts - - - Kenney and McArthur believe that this approach "can teach basic skills more effectively and less tediously than a librarian with a truckful of books."[32]

Computer-assisted instruction (CAI) - - - Various aspects of BI are available in software compatible with many library microcomputers. A letter from Susan Brynteson, Director of Libraries at the University of Deleware, as part of a sales package offering their "Library Research Skills, Four Programs for the IBM-PC" explains the advantages of CAI:

> CAI was chosen to replace the traditional bibliographic lecture format at the University of Deleware Library because of its many advantages to librarians, students, and faculty. University of Deleware librarians are able to use the previously spent lecturing to provide more advanced bibliographic instruction and to undertake other responsibilities. Students are able to learn at their own pace, receive immediate helpful feedback if questions within lessons are incorrectly answered, have the option of reviewing material not mastered, and have, at hand, examples from indexes, catalog cards, and other tools not easily visualized. In addition, the graphics and interactive nature of the lessons make instruction in use of the library more interesting and efficient.[33]

Gratch notes the many advantages of CAI:

1. flexibly scheduled instruction at locations close to home, school or work, and, in the case of libraries, to particular information access tools;
2. adaptive instruction that can individualize the pace, level of difficulty and instructional method,
3. private, non-judgmental instruction, response, and feedback, which, for example, removes the social stigma of making errors;
4. reduced student learning time;
5. assured progress in skill development;
6. continuous report to the learner of progress and diagnostic data;
7. increased achievement and/or retention;
8. a more enjoyable learning experience[34]

As of this writing results of CAI are highly variable.

Sessions geared to specific needs - - - These may range from a detailed analysis of a single citation index or the literature of

science fiction to an open session providing instruction in the use of an online system or bibliographic utility or an end-user service to sessions geared to special groups such as foreign students. Many librarians find these types of sessions the most exhilarating to perform as the participants usually have a vested interest and pay attention. The librarian has an opportunity to treat a special tool, concept or service in depth.

Reference desk instruction - - - Individualized instruction at the reference desk service has the potential to be the best or worst instruction. Sometimes careful one-on-one instruction results. Other times a harried librarian does not do justice from the instruction perspective. Uneven best typifies BI at the reference desk.

Videotape - - - An instruction session can be videotaped and made available in or out of the library.

Group discussions and seminars - - - Active participation is the primary advantage in any discussion format, particularly in small groups. This is difficult to implement as a primary program in a large institution, however. Morton at the small Carleton College believes that this approach results in "students who are more excited about digging for information, and who are better able to assimilate and interpret that information in their papers."[35]

Optional courses - - - These are potentially an excellent approach but are rarely attended by enough of the student population to make more than a dent in the overall BI program. They may be for credit or non-credit.

Required courses - - - Considered by many as the best potential approach, it may not be as effective as desired if not well taught, not comprehensive enough, or too removed from students' actual research needs. Instructors may range from librarians to library school faculty (if available) or even trained graduate students (primarily in library science). Again actual credit can be an option.

With so many potential program options, effective communications are essential for leading specific groups and individuals to the most logical approaches available at a given institution. Established faculty liaisons are the most obvious places to promote instructional services. Targeted classes should be approached through department heads or coordinators. Also, success breeds success. A top-notch BI session can bring in business imply by word of mouth. A poor session can damage credibility. Consult the recent books and articles listed in the suggested reading section for detailed analysis on how to set up and maintain BI programs.

C. Ideal BI environment

Ideally, the BI would involve students who want to learn about library research, teachers who want students to know about library research, librarians who effectively teach library research, and a library director who views BI as a high priority. It would be built into the system, mandatory, and not dependent upon anyone's whims or biases. It would display involvement by enough librarians so that the word "burnout" never creeps into anyone's vocabulary. It would take the burden of repetition away from the librarians and free them for more stimulating endeavors.

Where is this ideal environment? Perhaps the model programs such as Earlham, Swarthmore, Sangamon, etc. might be the best places to look. For example, the administration at Earlham evidently envisioned a special program for his library, hired staff specifically for this purpose, and created a success story that librarians have visited to view a prototype program for years and still do. Their programs change with the times and remain highly effective. Earlham has a close to ideal academic environment, with a relatively small student body, academically minded students and a "closely knit sense of community and very informal relationships among students, faculty, administrations and staff."[36] This is certainly a favorable situation for fostering an effective BI programs and is radically different than attempting to systematically meet the BI needs of an Enormous State University where 20,000-50,000 students reside, many with educational priorities and commitment quite different than an Earlham student. Even the difference between instruction by an established college professor comfortable with the library versus a more transient university graduate assistant, who is himself struggling with the library maze, has profound effects on BI.

The ideal is hard to find. Earlham and other model programs are not the norm. There are still library administrators who don't or simply can't support or recognize the need for systematic BI. When financial constraints take over, BI can be an area in the line of fire when cuts are mandatory. If the question was put to university faculty, "should we cut journal subscriptions or instruction programs," the answer might surprise. Don't touch the journals! Even some college presidents believe that librarians "have

exaggerated the difficulty and importance of bibliographic instruction."[37] Administrative support of BI varies tremendously and can greatly influence the ultimate success of failure of a BI program. At many institutions with a BI coordinator, BI is an appendage of reference services; at some institutions it is spread out among many individuals but without any real coordination; and at some institutions it is a library department on its own with cooperation from other library departments.

Another constraint which moves most programs away from the ideal is the problem of individual differences. Some librarians are simply more adept, no matter how much training, than others in conveying information in most BI settings. At institutions where most librarians have to participate in order to cover the heavy instructional loads, unevenness of BI quality can be a liability. (The same parallels can be made for online access, reference desk work, etc. where some people excel and others become frustrated and provide students with less effective service.) Skill in administering the overall program; skill in building an effective team of BI librarians; and skill, patience and compassion in training can help alleviate this problem.

Another problem found in the typical environment is poorly constructed library assignments. The more influence knowledgeable librarians have over the construction of classroom assignments, the better chance the students will apply the presented information in a fashion to accomplish effective learning. We've all experienced library "treasure hunts" that have resulted in bedraggled librarians and no real student learning. As Fleury notes, "Faculty are often

inclined to make their sole library assignment into a sort of benighted treasure hunt, in which students hop from one unrelated source to the next in their search for trivial and unconnected bits of information."[38] Other faculty assign many students to use the same book which just happens to missing after the first students get their hands on it. Resolution of these problems requires tact and open lines of communication between teaching faculty and librarians.

Even in an environment such as Earlham's, the most effective instruction is that which is attached to a real motivation to learn the materials as opposed to artificial assignments where students simply want to complete it and get it out of the way. What is even more dangerous is the situation where this one BI experience followed by an artificial assignment leaves the student believing that he/she now has library competence. A little learning can be dangerous.

Faculty resistance is another element that one finds in the typical environment. Reasons may be many including perceptions that a service group (librarians) should not teach (unless they need to get rid of their class for a day leaving the librarian with what Peele describes as "25 bodies in a lecture hall only 5 of whom are interested in what we are saying."[39]), fear of competition for academic credits (protecting one's turf), misconceptions about the perceived easiness of library research or the lack of real need for the information to be formally covered, resistance based on fear of appearing weak if anyone else teaches their class, resistance based on lack of any course time, etc. Librarians need to carefully and tactfully deal with a wide array of personalities and excuses to try

to implement a BI program. (Many faculty believe that they have to carefully and tactfully deal with a wide array of personalities and excuses when they try to meet their information needs in the library. In some situations librarians have to recognize that it is a two-way street when they seek cooperation from others.) Cultivating interested faculty is often the key. Student participation and interest seems to correlate highly with a visible instructor holding them responsible for the information in some logical fashion.

This leads us to program evaluation. It is very easy to continue year after year making some changes in the program, adding new approaches, removing old procedures. Evaluation can be a useful tool to determine whether the desired effects of BI are really being accomplished. Programs costing money need to demonstrate their effectiveness. Unfortunately much evaluation will lead to this result: Students provided with instruction will do significantly better in most measurement paradigms than students who don't experience instruction. Unfortunately, even with volumes of articles treating program evaluation, "evaluation in library instruction is not highly developed, and there is no model for evaluative techniques."[40] Another writer notes that "There is a large measure of self delusory belief that it is a good thing for library users but proof of the assertion, where attempted, usually amounts to self fulfilling prophecy if analyzed."[41] Some librarians would rather mimic the words of Mimi Dudley:

> When I read articles on evaluating library instruction programs . . . I long to remind the writers that they don't need to justify what they are doing . . . We are librarians, we believe in libraries, we know to the very core of our beings that it is a good thing to be able to

make use of our library resources. We also know that it is not a measurable, a quantifiable good.[42]

D. Future considerations

The present and the future are difficult to separate when considering library technology. Some libraries are far ahead of others. Technology years down the road for some are already the past for others. BI has to cope with a changing technology. BI has to make certain students can handle and understand traditional approaches, cope with current approaches and become prepared for what is on the horizon. Librarians now have to be aware of the need to convey information about more than just national databases, online searching via vendors, online catalogs, quick reference searching, etc. They may also have to talk about hardware, software, microcomputer applications, CAI options, laser optic technology, end-user searching procedures, down loading, word processing, spread sheets, etc. (Horne provides an excellent example of librarians teaching microcomputer applications as an important part of their BI program.[43]) They have to make knowledgeable decisions about which technologies to pursue in BI and how to get the information across. They have to convey information about the hundreds of bibliographic vendors, etc. and non-bibliographic databases. As online access becomes the domain of many, librarians will assume an additional new role as a different type of intermediary - - - not as searchers but as consultants to end-users so that their searching is effective.

Themes of many recent BI conferences and publications consider teaching about computerized information as well as applications of new technologies to BI. Hamilton has offered BI personnel a list of suggested instructional objectives for online systems library

instruction.[44] These were prepared for and accepted by the Direct patron Access to Computer-Based Reference Systems Committee, Machine-Assisted Reference Sections, Reference and Adult Services Division of American Library Association and provides a wonderful basis for building and examining BI with coverage of online systems in mind.

One final point about online access with regard to BI. Use of various modes of computerization and other new technologies will continue to increase as an integral part of reference service. "Unlike the many librarians who feel that computers have been thrust upon them, the next generation eats, sleeps, lives, and dreams computers. It is already second nature to many elementary school children. Online access will be no big deal."[45] Impacts on BI are obvious.

There appears to be another current trend. BI programs may consider emphasizing different audiences. The traditional instruction geared to freshman may give way to a variety of potential means for covering these groups (workbooks, CAI, slide-tape, etc.) and an emphasis on supplying groups who are really doing research (upper-division research classes, faculty, graduate students) with the more quality time of BI personnel. This approach is evident at many institutions. "Students who are involved with research and motivated by intellectual interests should be provided with additional instruction, instead of forcing additional BI on students who don't need the skill, or providing the advanced skills with artificial assignments."[46] Rettig states it well. "BI can be

justified, but only when directed at groups with both an immediate and a long-range need for such knowledge."[47]

This overall strategy for a BI program should more effectively reach more individuals and provide a better use of manpower for the many institutions where a fully integrated system is not feasible.

IV. Online access to information

A. General considerations

Financial constraints, administrative conservatism or even administrative neglect and deficiency may leave a library out of the mainstream of new technologies, whether online catalogs, online database searching, patron access to national databases (e.g. OCLC or RLIN) or other computer applications. Sometimes this is a severe liability to patrons and librarians who miss out on opportunities and important modes of access to information. Sometimes it is an asset to set back and watch technology sort out its problems, perhaps become less expensive, and then get into the automation armed with more information and the benefits of the mistakes of others. Thus one can be at the cutting edge of technology and suffer through mistakes or lag behind technology and benefit from observing others. Since technology is so multifaceted, one might be at the forefront of one aspect and lagging on the other. Most libraries lie somewhere in-between.

Most people think of the concept of computerization as ultimately a vehicle for efficiency, improvement of service as well as eventual cost cutting. One's initial outlay of money would supposedly pay itself back over time with the extra added advantage of doing more and doing better. Computerization with respect to reference services is ultimately cost cutting when considering applications of microcomputers to increase office and reference service efficiency. From the perspective of online searching it is not as clear cut. Certainly one can save money by cancelling the paper copy of an expensive index and relying solely on online access.

This is rarely feasible, however, as there are usually many reasons for maintaining paper copies. Manual access remains important despite the availability of online searching. Otherwise we watch the predicted "paperless society" drawing closer with a realization that the cost ramifications of online access are not clear cut. The trend of most databases is to go up in price. the applications of microcomputers and faster printers cut the costs. How it will sort itself out a few years from now is anybody's guess.

B. Database searching

1. Basics

Reference services have been greatly impacted on, (if not revolutionized, by) online database searching. Computer or online searching is an automated, interactive method of searching databases such as indexes and abstracts, newspapers, government publications, patents, directories, full-text encyclopedias and periodicals, corporate reports filed with the U.S. Securities and Exchange commission, abstracts of dissertations, statistical sources, a growing array of other reference tools with access to hundreds of databases, millions of items, over a billion words, in virtually all fields of study. What started as online access to a handful of bibliographic databases has evolved into most bibliographic indexes as well as many numeric, factual, full-text, financial, etc. databases. Few librarians can keep up with it all. Results of searches range from lists of bibliographic citations to bits of factual information. Results may be printed out immediately, printed

offline by the vendor and mailed to the patron or library, or even downloaded on to a disk and later edited and printed.

2. Vendors

The major three vendors in 1986 include DIALOG Information Retrieval Services, which offers the broadest array of databases; BRS (Bibliographic Retrieval Services); and SDC Search Service. Although there is much overlap between the three "database supermarkets," each offers unique databases not available on the other systems, and utilizes as a different search language. Each has different price structures for hourly connect time fees (prorated by fractions of the hour), and for online and offline prints in a variety of formats. Each can be accessed by data communications networks, e.g. TYMNET, TELENET, UNINET. Each offers their own selections of manuals, user guides, monthly newsletters, etc. Each offers an array of beginning and advanced training sessions all over the world. Each is supported by personnel at toll-free numbers offering advice and troubleshooting. Each has librarians which prefer it to the other two, although all three are typically offered in most academic libraries. Each is expanding into new technological arenas, many of which will be explored at the end of this chapter.

H.W. Wilson Company has joined the others as a potential major vendor. Its system, WILSONLINE, initiated in 1985, provides access to the 3,500 periodicals covered by Wilson in its many hardcopy indexes; tens of thousands of books Wilson catalogs each year; journal and publisher directories and name authority files. The system is updated at least twice each week. Up to eight databases

can be searched simultaneously. As of this writing WILSONLINE offered only the most recent few years of available online indices which often impacted on strategies librarians consider for deciding which vendor to use for access to information. This is further complicated by the familiarity that most patrons (and librarians) have with Wilson indices (e.g. Readers' Guide, Book Review Digest, etc.) and the habits of easily consulting these manually, particularly for single term concepts. (This can apply to most indexes which are available manually as well as online.) Some libraries began using WILSONLINE primarily as a tool for quick reference searching for recent articles. As the databases grow and more years are input retrospectively, these research strategies will be altered.

Another vendor that is making an impact is DATATIMES (Datatek, Co. based in Oklahoma) which provides full-text access to an array of newspapers throughout the country, as well as wire services. Newspapers who adopt their Electronic Communication Services can become available online (e.g. Arkansas Gazette, Baton Rouge Times-Advocate, Daily Oklahoma and Times, Dallas Morning News, Seattle Times, an Australian network, etc.)

Major other systems of note include MEDLARS ("The Computerized Literature Retrieval Services of the National Library of Medicine," including MEDLINE and BIOETHICSLINE) used by most health sciences libraries; the legal systems (LEXIS and WESTLAW) available in law libraries; online access to New York Times Index; and many other systems, too numerous to list completely.

3. Database scope

Every month the online database vendors add something new and different to their line-up of available databases and procedures. Since many librarians have difficulty sorting out the available databases, many types of published directories, local files, online sources, software programs, etc. have been devised simply to sort out the growing list. (Some of the end user software packages mentioned below help alleviate the decision making procedure.) In any case, given the plethora of available databases, the relatively small amount of money used up by quick dips into most databases, and the relative expense of purchasing printed versions of most often used indexes, abstracts and reference tools, there are days when some librarians believe they could provide excellent reference service to their university community by closing the reference desk, sitting down with a "dumb" terminal, database manuals from the major vendors, and an efficient patron queuing system[48] and perhaps save money. Then there are other days when they question their wisdom and wonder if we are "providing an educational impediment by going online; hand feeding a student a computer produced list of citations does not guarantee any understanding of the library, the flow of information, or the use of indexes."[49] Of course not everyone has a library at their disposal. Online access to all of these databases essentially moves the library into your office, home, etc. This is even more powerful when paired with the many electronic document delivery systems also available online, although expensive.

4. Advantages and potential problems

What are the advantages of this online access via a variety of vendors?

a) Speed. Online searching is fast. Many years of an index can be searched in seconds. Searches which can take hours manually can be completed in minutes or less. Results of searches can be printed quickly too. Many libraries have stopped searching at a slow 300 baud rate (30 characters per second) and have converted to at least 1200 baud rate. The faster one prints, the cheaper the cost - - - assuming vendors don't ultimately make pricing adjustments to recover some of this money.

b) Timeliness. Online searching is more timely than manual access, because databases are usually updated online before printed indices become available. New terminology not yet available manually may be searchable via computer.

c) Boolean logic. The major advantage of online access is the ability to use AND (to narrow a search), OR (to broaden a search) or NOT (to remove some elements from the search). "Red" AND "Blue" would retrieve only items that have both colors. "Red" OR "Blue" would retrieve any items that have either color. "Red" NOT "Blue" would retrieve all items with "Red" but no mention of "Blue." Some searches involve strings of dozens of terms with Boolean operators.

d) Interdisciplinary. Search strategies can be easily applied across an array of interdisciplinary databases.

e) Availability. Libraries close but one's research can continue. Online systems are available virtually 24 hours per day.

f) Only available access. No library carries the printed version of every online tool. Thus online access can be the only available access to some databases. Also some online databases have no corresponding printed index.

g) Language flexibility. Searchers have the option of using controlled language (terminology from a manual or online thesaurus or from the printed index), natural language or a combination of both. One can search only titles or abstracts or controlled language or all three simultaneously.

h) Truncation. Flexibility results when a searcher appropriately searches a root of a word, e.g. "librar?" for retrieving library, libraries, librarians, etc. on the DIALOG system. "Wom?n" would retrieve women or woman.

i) Adjacency. Online systems allow for the ability to search for words side by side, or within a specified number of words of each other, or within specific defined fields.

j) SDI. (Selective Dissemination of Information) Current awareness systems can be set up with selected terms searched automatically at a predetermined time period or whenever a selected file is updated. Researchers can be assured of keeping up with their topics.

k) Limiting. Searches can be limited by dates, languages, etc.

l) Saving searches. Searches can be saved and retrieved for later execution or modification in the same or different databases.

m) Verification. Online access provides an excellent tool to verify citations or to straighten out garbled citations.

n) Dead-end reference questions. Effective analysis of available databases paired with innovative approaches to searching can often result in answers for questions that were previously unanswerable.

Potential problems also exist:

a) Online searching is meant to be interactive, yet some librarians have trouble interacting. They approach each search with the same mental set of selecting thesaurus terms, combining them with Boolean logic, and printing the results offline. They don't give enough thought to degree of precision and many other potential searching strategies which may be more appropriate.

b) With so many databases available, some librarians fail to give adequate thought to which vendor(s) and which database(s) to consult. They also don't use special databases which help determine which online file(s) to search.

c) Some librarians tend to search online when a manual approach might be more appropriate. When the goal of an assignment is the manual use of a printed index or reference tool, computer searching should not be performed.

Topics for a short paper requiring just a few citations relatively easy to search manually do not require online access. Single concepts such as "child abuse" can be adequately handled manually. (Note: The advent of end-user searching, described below, may modify what we consider inappropriate.)

d) The opportunity for serendipity is lost when online access is the sole approach.

e) Inappropriate analysis of terminology before or during a search can impede success. Success depends completely on choosing proper terminology and manipulating these words or phrases or codes in an effective manner.

f) Service is sometimes uneven. patrons may have to contend with cyberphobic librarians who avoid online access even when appropriate. (The literature on resistance to computers, computer phobia, cyberphobia, technophobia, or technostress is large and will not be explored here.) On the other hand we also have to contend with over-dependers, i.e. librarians who excessively rely on computers even when not the best approach. Either extreme is potentially destructive and can lead to ineffective research practices.

5. Administration of service

a. Search service

Most academic libraries offer a search service either as part of reference services or as a completely separate unit. If part of a reference department, it may be supervised by the Head of

Reference or delegated to the Assistant Head or a reference librarian. Services range from one or two librarians doing all of the searches to online subject responsibilities for most or all reference librarians paralleling subject, collection development and/or liaison activities.

Typically searches are scheduled by appointment and conducted in a separate search service room away from the hustle and bustle of the reference desk. Equipment for searching may range from a simple "dumb" terminal to a microcomputer system. The search room should house all of the vendor manuals, guides, database catalogs and a variety of other helping aids. Ideally the search room should be large enough to accommodate patrons to observe and help interact with the system (some librarians might take issue and find the patron's presence to be a potential distraction; others believe that the patron's potential subject expertise can only be an asset). A larger search room can allow for useful online demonstrations to groups.

The patron normally fills out an application in advance which provides a vehicle to state the search problem, note terminology and synonyms, note language requirements, cost limitations, date limitations, need for abstracts, etc. This application may also provide vital information for statistical and billing purposes, e.g. name, address, affiliation, patron type (e.g. faculty, graduate student, under-graduate student), grant or account number, etc.

Monthly reports noting levels of activities, e.g. money spent, vendors used, databases searched, average search costs, etc. provide good feedback to searchers as well as library administration. A student assistant can be easily trained to circulate mail from

vendors to all searchers; post important information in the search room; keep up manuals, search aids, etc.; maintain patron files, maintain an adequate supply of search applications, evaluation forms, billing forms; produce monthly statistics and reports; bill patrons as necessary; maintain a detailed search log; and support other needs of the search service.

Librarians are confronted many times daily with situations that demand the decision of whether or not to search on computer. Batt recommends a system that treats almost every search request as a reference query with the potential for online access and attempts to implement the following steps:

1. Maximize the potential for the patron to realize what is available manually by checking printed sources with the patron. (Many an online request stops here and saves the patron or the library money). The patron gets a better feel for the manual counterpart (if there is one), and can often better explain the search problem.

2. Allow the patron to help formulate almost every step of the strategy (after an explanation of Boolean logic, truncation and other related concepts) by noting terms used in manual sources; searching available thesauri and other sources of terminology; determining what body of information should be searched (i.e., abstracts, titles, controlled vocabulary, free text searches); determining limits to set on the search (e.g. language, date); and understanding that the success of the search depends not only on what terms are used, but how they are used.

3. Allow for the search to be interactive by having the patron at my side hearing and seeing: a running commentary of what I'm doing; how many hits come up for each term, each combination, etc.; results of sample citations printed online; how we might modify the search based on results; whether we should print results offline, or why we might consider online; suggested formats for immediate online results, e.g., citation only, accession number and title only, or even just accession number for the cheaper online access when the printed counterpart is available and the patron doesn't mind tracking down the citations. (Note: using both a video display and a printer simultaneously enhances the patron interaction).

4. Allow the patron to maximize post-search success by carefully explaining how the printed items occurred (reviewing strategy as

it evolved), how to locate items in the library or by other means, how to balloon one's research by checking references or relevant articles.

5. Recommend other manual sources to supplement the online search when necessary.

6. Review payment procedures (if any); reviewing evaluation procedures. Good judgment can discern when some of the above steps are not necessary.

It is important to be equally careful with patrons who you initially turn down for computer access. I try to follow a similar series of steps by:

1. Checking a variety of sources manually with the patron to assure myself and the patron that the approach will be fruitful.

2. Explaining how the approaches to online access, e.g., Boolean logic, etc., don't really apply to this particular request and how manual access is effective.

3. Making certain that the patron returns to me if not successful or that I check back with the patron so that I receive feedback about the progress of the manual search and give both of us another opportunity to take a fresh look at online access.

4. Making certain that the patron knows how to locate materials.

5. Noting, for future search service use, what types of topic modifications would result in a valid online search (often done in step 1).[50]

Other librarians also offer some degree of caution. For example, Champlin believes that online searching is becoming overused and abused in academic libraries. "Instead of keeping it in its place, we may have begun to let it dominate the reference scene to the disservice of our patrons."[51]

b. Quick reference

Many academic libraries have integrated online searching into their reference desk routines by offering quick reference searching. At the discretion of the reference librarian, online databases might be consulted to help answer a reference query. This is typically after all known manual options are exhausted, or if manual access

would be excessively difficult, or if the best database to pursue a question is only available online, or if the best approach to answer a question is quick online access. These types of searches are not only fast, but also low cost, usually less than two or three dollars. Costs are typically absorbed by the library. Other uses of quick reference might be to print out an abstract if the manual tool is missing, to pursue a garbled citation, to search an item too recent for the printed source, or to "free-text" search a term not available in a manual controlled vocabulary.

It is prudent for reference departments offering quick reference searching to have a written policy or list of guidelines available and frequently reviewed so that abuse does not occur. Brownmiller et al. offer an excellent analysis of online-ready-reference searching at one academic library.[52]

Quick reference searching is best done at a location adjacent to the reference desk. Think of the terminal as simply another reference tool. A light-weight, portable, fast-speed (1200 band rate) terminal which plugs directly into the phone jack has proven successful for quick reference searching.

Since the costs of these searches are absorbed, a less detailed log (searcher, vendor, database, time online, cost, success rate) might be considered. The Search Service student assistant could add a compilation of this log to the monthly report.

c. Cost and funding

Currently most libraries are not able (or chose not) to cover all costs of online searching. Because of limited funding, free access is not feasible. As much as making individuals pay for access

to information goes strongly against the grain and philosophies of many librarians (White discusses the negative consequences when academic libraries impose charges for online searching[53]), libraries simply cannot afford to absorb all of the thousands of dollars required in the effective use of online database searching. Quick reference searching (use of online access routinely built into reference service) requires a financial outlay. Demonstration of online systems require money that is usually not charged back to patrons or departments. Online access for library related research for librarians or library administration has to be paid for somewhere. Bad searches (system or human errors) should not be charged to the patrons. Contracts with vendors (where a certain amount of money up front or ultimately guaranteed results in a specific discount) result in certain budgetary requirements. Even when patrons are billed, not all costs are recovered. People leave town, drop out of school, change addresses, go bankrupt. Thus, unless every entry into an online database is billed to someone combined with a vehicle for collecting all money prior to handing over the results (awkward at best) or unless a service charge is levied which makes up for unrecoverable costs, a budget is required. This doesn't not even consider other costs such as personnel (an online coordinator and billing clerk), space, equipment, dumb terminals, microcomputers, software, printers, paper, manuals, etc.

From the above analysis, it is obvious that online searching, although a necessity in academic libraries, is a service that soaks up money. Some libraries allocate part of their collection development funds towards online access. Some set up separate funds

for these purposes. Most libraries set up some kind of billing system to recover money for searches that are not of the quick reference variety. Many libraries can't afford any free searching at all and lose the luxury of using online searching as a reference tool.

Variations are many including: set fees for each search; set numbers of free searches for specific groups; costs as reflected at end of each search; costs as reflected on monthly bills; costs plus a set service charge; costs plus a percentage of total as a service charge; a specific percentage of the cost; differing cost structures for different levels of patrons, e.g. undergraduates, graduates, faculty, non-affiliated (who typically pay the most if online services are available to off-campus groups); etc.

One problem perceived by many with respect to pricing for information is that libraries may be only providing this access to information to an elite group. In the same manner, online access to end-users is available only to those who can afford microcomputers or have access to them. Stieg provides an historical perspective (and excellent bibliography) to the fee versus free problem. She notes that "It is clear that librarians are caught between their inadequate resources and their professional values" and concludes that "In this technological age it is entirely possible that the costs of database searching may diminish to a point where libraries can easily provide them free of charges. It is also possible that the funding of libraries may increase sufficiently to enable them to eliminate fees and render the entire debate irrelevant."[54] Many libraries might take issue with her optimism.

d. End-user searching

Three recent developments have resulted in extensive treatment of searching by end-users (as opposed to intermediaries such as librarians) in the library literature: 1) The availability of user-friendly systems by major database vendors available to academic libraries, 2) the ability for the ever increasing number of people owning (or with access to) microcomputers to search online without having to depend on intermediaries, and 3) the development of software or "gateway" systems to lead the user step-by-step through the search processes as well as other software packages that aid searchers in a variety of ways.

Many libraries offer the user-friendly systems offered by vendors, e.g. BRS/After Dark, BRS/BRKTHRU, DIALOG's Knowledge Index, etc. (For an analysis of BRS/After Dark, consult Mader and Park.[55]) Some do so because they figure that since users will be investigating the potential of conducting their own searches, they should become actively involved in offering this capability within the library. Others pursue the offering of end-user searching in hopes of taking the pressure off of the library's overloaded search service. Still others, without the financial ability to offer free quick reference searching as a part of reference services, offer access to the relatively cheap end-user systems instead. For comparisons of end-users and intermediaries searching capabilities, consult Janke. The author finds that the provision of "presearch counseling service seems essential to the effective operation of a full fledged end-user service."[56] The literature of end-user searching and related topics (front-ends, gateways, impacts etc.) has been growing dramatically

during 1986 and 1987. Articles are freguent in the library and information science literatures and most will not be treated here. Books on end-user searching have been published and more are schedule for 1988. The debate continues regarding who ultimately searches more effectively. In Hunter's words, "The argument over whether the intermediary or the end-user does better searches on today's systems is by no means resolved, and it probably will not be before these systems have gone the way of the dodo."[57] When considering arguments by librarians against end-user searching, we must keep in mind the potential for online searchers and librarians to attempt to protect their own turf and maintain the prestige they've developed over years as providers of computer "magic."

Des Chene[58] reports on a number of interface systems that simplify online searching by end-users by interposing a "user-friendly" protocol between the user and the database system including many commercial systems (e.g. Search Helper, EASYNET, InSearch--which changed to Pro-Search after further development, etc.) and even consumer services such as The Source and CompuServe. Recently H.W. Wilson has developed WILSEARCH, software for direct patron access which formulates a search automatically, offers a menu of subject areas, suggests databases and provides instantaneous online retrieval. This is essentially a personal computer software version of WILSONLINE. Note that a review of WILSEARCH in RQ was not particularly favorable. This reviewer found it "awkward and somewhat frustrating to use."[59] Other users and reviewers have had kinder comments. Many additional gateway systems have been and will be developed.

The recent literature about end-user searching primarily explores the changing role of the intermediaries. Only a few years ago many librarians responded negatively to the notion that patrons could search online by themselves. Articles addressed the skills that would be lacking, the problems and frustrations of infrequent searching, the relative efficiency of the librarian versus the naive end-user. Even Roger Summit from DIALOG voiced concern about end users retaining skills.[60] Other articles point to the phenomenon that some end-users till want the "experts" (i.e. librarians) to do their "real" searches. Not soon after these articles voicing concern, contributions to the literature assumed that these end-user systems would be available and focused instead on training of end-users, librarian assistance, costs and pricing, housing of the service, etc. Librarians began to realize that 1) "gateway" software would have a major impact, 2) many individuals don't have access to intermediaries in libraries but still maintain the need and desire for online access, 3) many individuals besides librarians are more than capable of successfully performing online searching (and some librarians are not all that capable), and 4) so many individuals are so comfortable with computers on a daily basis that online searching will quickly become second nature.

The literature reflects a changing role for librarians, i.e. as a source of instruction and support for end-users who desire to search. Batt noted that "End-users will be doing their own searching if they have the equipment, the need, and the desire. Part of a librarian's future duties will be to facilitate online searching by end-users. After all, teaching others to acquire the skills to do

research is one of a reference librarian's goals."[61] Des Chene points out a serious question which will have to be addressed, that of funding. "Will end-users be willing or able to pay to perform searches that previously were free when done manually."[62] Also she wonders who will pay for online ready reference questions if end-users search for themselves. As for most library services, many approaches and variations on these approaches will be apparent. Ojala mentions a number of other important considerations, for example librarians have knowledge not available to end-users. From experience they realize that "Product literature from database vendors can be misleading . . . data in some files are of better quality than data in others . . . much information is not online, not indexed, and sometimes not even in printed form . . . the same information can be found in different databases for very different costs."[63] Librarians have much to convey to end-users and could foster a cooperative relationship that should be maintained for years. Perhaps Chiang offers the best attitude toward end-users. She believes that libraries expand their range of online services when they offer end-user instruction. Such instruction enhances the library's image. Her response to the end-user threat: "If you can't beat them, don't join them---lead them."[64]

C. Other reference automation

1. OCLC, RLIN and other national databases

This section will treat potential uses of national databases, focusing specifically on OCLC and RLIN.

OCLC (Online Computer Library Center) provides access to nearly 20 million bibliographic records form thousands of libraries of all types nationwide. Based on Columbus, Ohio, this network provides a vehicle for shared cataloging, interlibrary loan, acquisitions, and other systems. As a reference tool available to patrons and librarians in many academic libraries, OCLC offers citation verification; author searches; title searches; author/title searches; access by ISSN, ESBN, LCCN, SuDocs numbers; and many other functions. Another important reference use is the ability to determine other area collections holding materials. If interlibrary loan is not timely enough and/or the patron wants to visit other libraries for specific materials not available in the home library, this information is readily available online on OCLC. Searches can be qualified by publication dates as well as kinds of materials, e.g. manuscripts, scores, serials, sound recordings, audiovisual materials, machine readable data files, etc.

RLIN, offered by Research Libraries Group (RLG), also provides access to a similar number of bibliographic records as OCLC from about two dozen of the nation's major research libraries and many other special and associate members throughout the country. As with OCLC, RLIN provides a vehicle for shared cataloging, interlibrary loan, etc. From the reference point of view RLIN is a more flexible and powerful tool than OCLC. Access to a variety of files (books, films, records, scores, serials, etc.) is not only by authors or title, but also via parts of titles, single words, Library of Congress Subject Headings and many other approaches. One can mix modes in a search statement and use Boolean logic and truncation.

Among other systems available via RLIN are online access to the AVERY Index to Architectural Periodicals; the Eighteenth- Century Short Title Catalog; and the RLG Conspectus online for collection development information and comparisons; and SCIPIO, the Art Sales Catalog Database.

Subject access with Boolean logic and other traditional online search powers (truncation; adjacency; qualification by date, language, etc.) now is available for a subset of the OCLC Online Union Catalog. OCLC's Electronic Access to Subject Information (EASI) provides access to approximately one million recent bibliographic records reformatted from the MARC format display into an easily read public access display. This database is made available via BRS. BRS itself is available via OCLC Gateway systems on OCLC terminals.

As of this writing OCLC's plans are ambitious from the reference perspective. A new service, UNISON, is designed to provide the ability to locate information at third-party systems through the use of directories; to manipulate information using a personal work space and command files; and to distribute, disseminate and communicate information through messaging. The part of this new system with major impact on reference service is the telecommunication link to group information providers and their databases over the OCLC telecommunications network. In other words, OCLC is a one-stop-shopping-center for database vendors as well as its own systems.

RLG's future also impacts on reference services. Software is being developed to allow IBM PC's with a specific standard hardware configuration to work like an RLIN terminal. Other plans for RLG

system software to keep in mind, in the words of RLG President Richard W. McCoy, is the library "as a gateway to information resources of many sorts, and as a facilitation of access to local, national, and international information."[65] For example software programs are being developed for microcomputers that will make RLIN look like an on-line catalog.

Another useful RLIN tool is their electronic communication systems. From the reference perspective this opens up an important vehicle for expanding reference services via a network of reference coordinators. Difficult or dead-end reference questions not findable in one's own collection or on the available online databases can be sent on the RLIN computer to liaison individuals at one or more other research collections. Answers, if available, can be quickly relayed back to the querying library. This system is also used to relay general information of interest to other RLG members and to share policies, procedures, problems, etc.

Reference services offering public OCLC, RLIN and other network terminals for bibliographic citations and access beyond one's own collection should provide both short, clear and concise instructions as well as access to more detailed manuals. Copies of basic search techniques should be available adjacent to the terminal. Information next to the system should make it clear what percentage of the libraries materials are entered into the system, what information the major fields on the display provide, the size of the total database as well as subdivisions. It should include what the system does and even more important what the system doesn't do. Vendor produced user guides should also be available by the terminals as well as clear

instructions to consult the librarians for additional aid. The availability and potential uses of these systems should also be incorporated into bibliographic instruction programs.

2. Microcomputer applications

One need only to turn to any library journal to be barraged by article after article and advertisement after advertisement espousing microcomputer applications for virtually everything. More and more microcomputers are sitting in offices initially because everyone else is doing it and then because of the realization of capabilities available. Libraries are filled with staff who are tremendously excited by the new worlds and abilities opened up by computers as well as the new-found efficiency of performing old tasks. Libraries also have individuals who still resist the new technology and literally tremble with fear when faced with the impending necessity to be accountable with respect to computer procedures.

Reference departments can benefit from the capabilities of many software programs simply to increase office efficiency and to be able to easily produce more types of tools. Computers are not a passing fad. They simply allow us to do more, more effectively and faster. They allow us to write, teach, plan, analyze, evaluate, etc. For example, word processing can be used in virtually all situations where a typewriter is used, e.g. memos, reports, bibliographies, correspondence, papers, with much more flexibility. Spread-sheet software programs allow for more effective statistical analysis and are useful for any type of budgeting projections, record keeping,

etc. Database management software can be used for mailing labels, inventory, periodical lists, and similar applications.

Software is also available for BI. Examples were mentioned in the section treating "Teaching of library use." Software can be purchased to help students learn how to use many tools and library research approaches ranging from an array of indexes and abstracts, to reference tools, learning call number orders, and even online searching techniques.

Another advantageous use of microcomputers is as a vehicle for on-line searching. As compared to searching on a "dumb" terminal:

1) connect time is less, thus search costs are less
2) results can be edited to fit local needs
3) results can be downloaded on a disk
4) results can be printed, displayed, stored electronically, uploaded to another computer
5) the microcomputer can be used for many other library applications besides on-line access.

There are many possible configurations of hardware and software recommended in the literature for on-line searching with microcomputers. Kolner provides one such careful analysis and lists of recommendations for a microcomputer, disk drive, modem, printer and other options.[66] There are many other workable configurations. With new technologies and equipment available almost daily, it is very difficult to feel too comfortable. The concept of state-of-the-art is nonexistent. By the time one sets up one's new system, a better one is being advertised. As soon as you purchase

software for a specific purpose, new and improved software seems to be on the market.

3. Patron access computers

Depending on the progress towards automation, some libraries may have online catalogs covering their complete collection or a growing percentage of their collection. Online catalog terminals may be housed adjacent to a card catalog which was closed on a specific day (this requiring two places to consult) or they may completely replace the catalog. Other locations may be throughout the library and even throughout the campus. There may even be dial-up access from off campus. The online catalog may be backed up by a microfiche catalog, a COM catalog (film or fiche), a card catalog, a tandem computer system, or not at all. The literature is full of analyses of the assets and liabilities of these and other potential arrangements for the online card catalog.

From the perspective of reference services, it is important that BI include a comprehensive analysis of the state of the catalog including coverage, percentage and portion of collections included in and excluded from each portion of the catalog, and specific recommended strategies for accessing the libraries collections. It is also crucial that these types of information are included on directions adjacent to the terminals as well as in any printed handouts and library guides. The most difficult period is during the transition when an online catalog might include only a percentage of the collection. If the patron is only getting part of the story or if access is not yet available via all search modes (e.g. only author

and title but no subject), the patrons should be aware of this and should realize the limitations of the computer access as well as best strategies for complete collection coverage.

V. Communications and relations with other library departments

Mostly one thinks of the dichotomy between technical and public services when considering the communications needs within academic libraries. For excellent service, effective communications within the elements of the reference department are crucial, i.e. reference desk, online search service, collection development, BI, etc. all should work together towards offering cohesive and even service to the academic community. Also, since most branch libraries offer most if not all elements of reference services, effective communications between main and branch services is important.

Communications with other public as well as the technical service library units are also important to the overall effectiveness of library service. Reference and access services often work together, e.g. reference desk personnel might be involved in ILL verification procedures. Reference and cataloging work together, e.g. there is a constant stream of transfers, withdrawals, rush processing, special considerations, reclassifications, etc. which require good rapport between departments. Reference collection development requires effective interchange with collection development and acquisitions. Maintenance of reference serials requires cooperation with the serials department. The advent of online catalogs results in much coordination between cataloging and reference. Potential staffing of card catalog and/or information desks by a cross section of library personnel required much joint coordination and communication.

In some situations effective communications between divisions can make or break the programs. For example, a service offering

online access to newspapers should be explored in detail with the public service area servicing newspapers in order to promote proper referral. another example is changes in online service procedures or philosophy which directly influence workload in ILL. Generally most reference activities impact on other areas of the library. Reference staff must explore ramifications of any reference activity on other units, solicit information and opinions from other areas of the library, share minutes of meetings, invite potentially effected areas to joint meetings, share proposals when applicable, and generally leave all of the lines of communication open.

As the line between public and technical services blur, given automation, budgetary constraints which require more cooperative endeavors and more individuals with the ability to work effectively in both areas, the necessity for effective intralibrary communication becomes even more crucial to the overall success of the academic library. For example, many libraries have created groups of both public and technical services librarians to address the increasing number of mutual public and technical services concerns.

VI. Evaluation and planning

The theme conveyed by many authors in many fields is that active planning is a more productive approach than passive waiting. It is the difference between proactive and the potentially more frustrating reactive approaches. Careful analysis of one's situation followed by the examination of basic goals and objectives followed by the determination of an array of strategies to achieve these goals (with appropriate feedback and evaluation systems throughout the procedure) create a more effective environment than spending one's time reacting to problems without any real sense of direction. Many variations on this type of theme abound through virtually all of the literatures. Librarians are certainly not innovative in this realm.

To be able to effectively evaluate reference services and plan for future courses of action, librarians should be aware of the many available sources of information related to evaluation and planning as well as what libraries have been doing and what library research has discovered. There has always been a steady stream of literature in books as well as journals such as Reference Services Review, Journal of Academic Librarianship, College and Research Libraries, RQ, The Reference Librarian, etc.

As funding limitations hit library authors close to home, accountability becomes important and more prevalent. When adequate staff and funding are far from guaranteed, evaluating service quality and specific plans of attack to maximize efforts and divert energies to specific targeted services becomes more prevalent. Some of the research is described below and reflects this need for accountability and logical analyses of what we are doing and why.

Besides awareness of what other libraries are doing about providing service under the pressures of a variety of financial situations, it is also instructive (if not also frustrating for some) to have some awareness of the ideal situation. Publications such as ACRL's Standards for College Libraries provides "a realistic set of conditions which, if met, will provide a college library program of good quality"[67] and describe the objectives which should be developed, the nature and size of the collections, the organization of materials, the nature and size of the library staff, the range and quality of services, the nature and size of facilities, and the administrative and budgetary approaches. Although no more than a pipe dream for some libraries, standards at least provide something specific to strive for and perhaps even leverage to attempt to acquire increased funding and staffing. As Gapen and Morse note, "As higher education professionals, we must continue to adhere to these nationally accepted standards in order to build these measures of excellence into our planning and budget requests."[68]

Others are less taken in by standards and statements of adequacy and note the related game playing. For example, Moran believes that "Statements of adequacy may be useful on a practical level, even though not valid theoretically. A university library with a collection well below a standard may use it to obtain additional allocations. Those with collections well over the levels defined as adequate may properly keep quiet about it . . ."[69]

A major stimulus for planning is the need to automate at many levels, most directly affecting reference services. This is a period of flux which makes planning both difficult and essential. Moran

points out that "all libraries should be planning now for the changes that will be necessary to meet the demands of the information age."[70] Olum notes that even the best and largest library is going to be necessarily inadequate.[71] Moran recommends faculty librarian and administrative participation in these planning endeavors and notes that universities must be willing to make difficult financial commitments necessary to allow libraries to retool.[72] Some of this money must be geared toward the expenses of cooperative efforts, i.e. computer systems, telecommunications, network participation, charges and fees, etc.[73]

How does one go about evaluating the effectiveness of reference and other programs? What comprises excellence in service? Libraries are extremely complex organizations. The services that they offer are multifacted. The best minds in the academic world agree that the evaluation of library effectiveness and excellence as well as analysis of relevant criteria related to this evaluation are complex issues and are hard to define. Each of the various modes of approach may isolate specific aspects of library service but none offer a systematic view of the total picture. For example, comparative analysis of reference collection size doesn't touch on quality. Collection analysis doesn't measure service. Two collections of equal size may better serve different patron groups if one stresses multiple copies of frequently used items and the other includes only one copy of each title. Some experts believe that a library is only as good as the library staff who provide access to the collections. Others stress the collections. In times of financial constraints, some stress cooperative efforts as being most crucial.

On the one hand some academicians believe that as higher education professionals we must continue to adhere to nationally accepted standards in order to build these measures of excellence into our planning and budget requests. Other leaders in the academic world chose to de-emphasize current quantitative measures and standards and replace them with new criteria for judging libraries such as inter-institutional cooperation, acceptance of new technologies, preservation, contributions to nontraditional education, commitment to the protection and preservation of intellectual freedom, and clearer appraisal of the role of the library in the total educational process.[74]

In any case, many authors seem to be calling for increased attention to evaluation in libraries. Some of the experts believe that there are problems inherent in doing one's own evaluations and that many libraries would do well to pursue outside consultants. Others believe that there are effective internal approaches for evaluating one's services.

Evaluation and planning specifically in reference services has involved many potential approaches and branched off in many different directions including inobtrusive observation, direct observation, sampling, self-evaluation, collection evaluation, evaluations of behaviors, evaluation of the reference interview, evaluation of patron's opinions of service, use of performance measures to evaluate services, case studies, strategic planning, interviewing, questionnaires, etc. Evaluation can uncover the current status of the service; help in the modification of goals and objectives; and help establish the department's philosophy of service. Before we

explore some of these approaches with regard to reference services, a point made by Bill Katz should be reinforced. ". . . after all is measured and evaluated, the primary purpose of reference service is always to answer questions. It is extremely important that the purpose never be lost, that no matter what type of evaluative measures are employed the final result will be better service for more people."[75]

Planning specifically for reference services is difficult. With service becoming more diverse and patrons more knowledgeable and demanding, priorities are needed. It is a time to evaluate what reference departments are doing and planning courses of action to cope with rapid change, new technologies, and increased patron demands (who expect traditional as well as innovative reference services) often in the face of financial and staffing constrictions. This is further complicated by the many studies demonstrating reference desk accuracy rates approaching the 50% level. Supposedly reference desk personnel haven't been doing very well. This will be treated in more depth in the final section on current themes and future trends.

Recent articles have pointed to a theme that perhaps reference departments have bitten off more than they can chew and require much more planning and consideration of patron needs. At a time when financial support of library programs are in some locations shrinking or at best not growing fast enough to keep pace with new ideas, many reference departments are offering an array of services and promising an array of results that they really couldn't meet if any one program really "took off." Miller notes that some library planning experts

recommend that in the face of economic restrictions we stop trying to be all things to all people; decide through careful planning, data gathering and analysis what programs we should offer; and do these well, as opposed to doing everything in a mediocre fashion.[76] Martell takes it even further. His client-centered approach detailed earlier in this chapter calls for changing the thinking of librarianship and advocates an alternative which "brings librarians together into small work groups that are allied with designated client groups in the academic community."[77] His functional design involves librarians acting in a multi-function capacity (i.e. reference, collection development online searching, library instruction, original cataloging, etc.). Support activities would include circulation, non-original cataloging, ready reference, serials processing. This is an intriguing approach but has some drawbacks if applied in an already exsisting traditional service. Anyone working in a traditional public or technical service department can quickly envision the many potential strains of resistance. For example, some reference librarians already feeling put-upon by online access which they are not particularly adept at performing might be even more resistant to something as foreign to them as original cataloging. Some serials processors who also work in serials public service areas and consider themselves in the mainstream of client activities might resent the label of "support activities."

What really counts here is that both Martell's, Miller's and other recent writers' concepts are based on sensitivity and responsiveness to clients, an area where Martell notes that "the

library is relatively insensitive and unresponsive,"[78] partly due to financial constraints and partly due to restrictive policies. Some may choose to take issue with this, after all much of the writing and action in library science through the years involves considerable sensitivity to patron needs, but there does seem to be a recent renewed look at the client. Suffice it to say academic library reference departments need more and better planning. Any planning and any philosophy of reference service must have as its focal point the academic community that is served. Any modifications of service, new programs, etc. should ultimately result in benefits for library users, particularly this primary clientele.

As Miller notes, "In practice, when we try to serve everyone superbly, we end up serving no one especially well."[79] As new services are added to old, our traditional reference services "decay like an inner city."[80] The next step is obvious. Overworked librarians begin to become less and less effective as their skills are spread across too many programs (or perhaps the opposite situation of doing too much of the same thing day in and day out). Thoughtful planning is necessary to rejuvenate both the staffs and programs of a reference department heading in this unfortunately common direction.

This is not the place to present a detailed analysis of performance measures, strategic planning, etc. This will be left to a growing literature. Only a few specific approaches geared specifically to reference effectiveness will be treated below to provide a feel for some of the potential applications. These will

include some models for reference service evaluation, and more specifically methods for evaluating reference desk performance.

Olson provides a model of reference services evaluation which investigates four objectives to fulfill the goal to "Assess the Quality of Reference Service offered to the Public": 1) performance on requests for factual knowledge, 2) knowledge of library policies, procedures or services, 3) provision of BI, and 4) performance of interviewing techniques.[81] Objective 1 was assessed by analyzing via obtrusive techniques; objective 2 was measured by an assessment exercise administered to the staff; objective 3 was measured by questionnaires; and objective 4 was done by unobtrusive testing. The author believes that implementation of such a program over a period of time provides the library management with important information about the quality of reference services but warns that it is not a vehicle for information geared towards retention, tenure, promotion, merit, etc. She instead sees this as a vehicle for determining staffing modifications, developing in-service programs, etc. Implementation of such an ongoing evaluation system would require continuous feedback to make certain that the resistance to such a rigorous approach was not detrimental to service or creating too much anxiety. In extremely busy reference departments which are understaffed, this approach might be considered too complicated and distracting. In other reference departments, some form of this approach may be a tremendous boon to service.

It might be prudent to note Bookstein's analysis of questionnaires as flawed instruments for obtaining formation.[82] Olson used questionnaires to evaluate the provision of BI. Also,

another methodological approach for evaluation of the reference interview (Olson's 4th objective) is offered by White.[83] Of particular interest is her analysis of the content, form and end product of the reference interview.

Along similar lines, and with the goal of improving reference desk service, Schwartz and Eakin reported their library's attempt to develop standards for evaluating the performance of reference librarians as part of the goal-based performance evaluation. Although the process of developing standards (conveying a proper attitude and manner, providing assistance at the appropriate level of need, displaying thorough knowledge of resources and collections, planning and executing effective search strategies, understanding and communicating services and policies) contributed to a sense of cohesion in the department and the whole procedure led to more consistent service, the built-in process of peer evaluation still resulted in some degree of negative and emotional response (perhaps related to competition, distrust, feelings of vulnerability).[84] Schwartz and Eakin's approach as well as Olson's approach mentioned above provide starting points for reference departments to discuss effectiveness and accountability and hopefully build a system to measure and improve service. Any system which is geared towards evaluating one's performance is going to be threatening and met with resistance by some individuals. It is usually fairly obvious when "evaluation time" comes around in an academic library. Peer evaluations can be particularly devastating, yet Young believes that "it would seem reasonable that those in the best position to judge

are our peers working with us at the desk."[85] There is a price to pay for attempting to measure effectiveness.

VII. Current themes and future trends

This final section of the reference chapter will treat the most prevalent themes in the literature of reference services as well as analyze the potential impacts of proposed future trends.

The themes have already been introduced, i.e. coping with the diverse findings that reference desk service is inaccurate or approximately half-right and dealing with the other related articles which essentially note that reference services are having a rocky time of it. Hopefully some potential resolutions of these problems will be uncovered.

The future trends will treat the potential impacts of diverse new technologies and approaches for storing and retrieving information and particularly the implications for reference librarianship. Although the crystal ball is blurred, there are some good indications of where we will be in a few years and even some radical guesses for the scenario further in the future.

First we will deal the problems endemic to the reference desk and throughout reference services. William Miller's article "What's Wrong with Reference . . ."[86] touched many raw nerves and stimulated many articles reinforcing the perceptions that all is not well. Many reference departments have realized that they are over-committed beyond their levels of competence and also realize that some new aspects of automation may add to the workload even further. Miller and Rettig also take a few pokes at reference desk services. They believe that "reference librarians have lost sight of their purpose . . . Ranganathan's Fourth Law of Library Science: Save the Time of the Reader."[87] BI approaches don't do it. "Reference services in

academic libraries, aimed as it is at producing independent clients, is obsolete."[88] Reference desk approaches toward library patrons don't do it. "Library reference desk staffing is the equivalent of having a certified mechanic staff a self-serve gas station to collect money and make change."[89] The authors believe libraries must change and become information providers or become increasingly obsolescent.

One evident result of these reference desk problems is that the service effectiveness as measured by unobtrusive testing is shockingly poor. Most reference desk personnel confronted with these results take immediate issue and say something such as "no way, we do better than that!" Yet an impressive array of studies by a variety of highly respected researchers leads to the same result, i.e. we only answer slightly more than half of the questions accurately. More specifically, correct answer fill rates seem to remain in the mid 50% range no matter what type of interventions are attempted. A recent study by McClure and Hernon is even more discouraging. "Even in distinguished libraries where you expect better results, the correct answer rate for some simple reference questions was only 57.9%. Equally appalling, when the librarians were alerted to that performance, and even subjected to "one-shot" workshops on the questions, their performance, tested unobtrusively again, did not improve."[90]

Crowley reviews the major studies of unobtrusive reference tests and believes that "until librarians deal effectively as a profession with the many and seemingly endless source of error in reference work, we will remain passive observers of popular culture."[91]

What can reference people do about this embarrassing situation? What can library educators do? Reference desk service is a skill that really needs to be learned on the job. Library schools could improve the quality of reference service by offering more opportunities for application of skills (reference desk graduate assistantships, internships, etc.). Perhaps future reference librarians can be identified and provided with higher level reference courses (at the expense of other curriculum?). Reference administrators should pursue any means to continuously improve reference desk personnel's knowledge of sources and strategies. Also important is training in empathy for the patron. The reference person has to want to answer the question and answer it correctly. (Unfortunately librarians under pressure at a busy desk and/or perhaps being on the front for too many consecutive hours--or years--may have as a primary goal to just make the patron disappear.) Along with empathy, a team approach to accurately answer questions is essential. Referral internally or externally is crucial. Asking for help should not be considered a sign of weakness. Training for innovation, perhaps impossible, should also be attempted. Empathy and innovation aside, to wipe out the image of half-correct reference, library administration needs the guts to get rid of ineffective, uncaring reference personnel or at least move them to positions not requiring public contact where they are responsible for reference aid. To perform at an acceptable level (not easy to define -- 70%? 80% 90%?), reference departments need to be more accountable. Perhaps part of the problem is in the emphasis of evaluations. Perhaps reference desk accuracy doesn't really matter as much as

publications, committee work, number of online searches, etc. when evaluation, tenure, promotion and related decisions are made. It is all a matter of priorities. If the priority of a library was to have the most talented professionals always at the desk with the primary goal to answer all questions as accurately as possible, the percentage of correct answers even on an unobtrusive factual type of study will rise dramatically.

A few other points should be mentioned. Most unobtrusive studies isolate only one aspect of what goes on at the reference desk, i.e. answering factual queries. Some of the reference personnel who remain least effective in this pursuit are the best at the reference desk teaching functions. They know how to instruct patrons on how to find their own information. Also, although only 50-60% of the planted questions are answered accurately, during any given time period the reference desk personnel hopefully negotiate a higher percentage of questions accurately. Perhaps a continuous analysis based on periods of continuous questions might reveal a different side of reference desk service. Evaluation of regular activity (candid camera?) would demonstrate that our actual success rate is higher. On the other hand, a steady diet of factual type questions over a prolonged period might yield results even worse than the unobtrusive studies.

These current themes of reference ineffectiveness and overload will be with us for awhile and will have to be dealt with simultaneously with the current and future pressures and changes that will result from computer applications, treated below.

Microcomputers appear to be making the major impact. Complete issues of some journals are devoted completely to microcomputer applications such as the Fall 1984 issue of Drexel Library Quarterly. At the 1986 Software/Computer Conference and Exposition for Information Managers and Librarians at Atlanta, Georgia,[92] topics included but were not limited to uploading, downloading, reformatting, the library Macintosh, library knowledge as a component of computer literacy, a variety of options and uses involving database management systems, microcomputer centers in libraries, computer assisted instruction, front-end and gateway services, end-user systems on micros, selection information for hardware and software, and many other related topics. Given OCLC's and other bibliographic utilities' decision to go with microcomputers instead of "dumb" or "semi-smart" terminals, many libraries who didn't even consider having microcomputers on hand now can benefit from the many advantages and applications. Milliot[93] describes a 1984 survey of library microcomputer use conducted by Knowledge Industry Publication which displays the scope of micro use even a few years ago. Among the applications were general management; catalogs, lists, bibliographies; local database development; remote database searching; CAI; local database searching; circulation control and backup; acquisitions; ILL; serials control; AV control; online catalog; reserve book room. (Note: Skapura offers a list of about 40 library applications for just Apple Works.[94] Roose offers a similar analysis, [95] as do many others throughout the literature.) The bulk of Milliot's book consists of profiles of library microcomputer projects. This is recommended reading for anyone

desiring to simply get a feel for the wide scope of applications. The near future will undoubtedly result in even more innovative library applications as microcomputer access becomes assumed and widespread.

Librarians have been passive users of databases for quite a few years. Now we are beginning to become more active in database creating, maintenance and manipulation primarily because of the availability of microcomputers and database management software. Carlson notes that "nearly every area of a library's operation is conducive to database development"[96] but cautions that "human resources may well run out before financial resources do."[97] Some libraries are fortunate enough to possess a "rabid micro freak."[98] Anderson offers an excellent analysis of what he considers the ideal library microcomputer (the Macintosh), and a useful analysis of journals and other guides which offer selection information about software. This provides valuable reading for libraries still making the microcomputer decision.[99]

What will computer applications do to reference services a few years from now? How about by the year 2000? Articles are published monthly which attempt to make these predictions. Many librarians react somewhat negatively to these prediction attempts. Overwhelmed by busy reference positions without much time to reflect on the future, many librarians believe that the flexibility to react to the daily crises is more of an asset than the ability to predict. Yet planning is predicting. Computers surround us. Even the typical academic library of today is potentially confusing enough for patrons and employees who must face online catalogs, national databases,

hundreds of databases from many vendors, terminals linked to university mainframe computers, microcomputers serving many functions, etc. Adding some of the new capabilities and technologies on the forefront make libraries even more complex. Just keeping up the monthly innovations on DIALOG is difficult for some. How this all will effect reference service depends on monetary aspects (both costs of automation activities and support that libraries can receive to pursue new technologies), librarian effectiveness in integrating appropriate technology into reference services and using cost saving techniques and equipment, and vendor plans (how much retrospection will be added, what will be the trends for online charges and telecommunications costs, will more full-text be available, what types of software will be available for end-users, is online searching fairly well developed or have we just seen the tip of the iceberg, how will the growing array of gateway systems offered by major vendors and other companies effect end-user effectiveness and the demand for intermediaries, etc.). Note that Kesselman offers an analysis of front-end and gateway services.[100] Although these and other considerations will shape our future, an important goal of reference librarianship will remain the teaching of others to acquire the skills to do their research. End-users will know that if they need help, it will be available in the library. The professional level of support will be higher. As we look ahead to new technologies, we begin to realize that Lancaster's "paperless society" predictions were pretty much on target.[101]

Another future trend may involve the relationship between libraries and computer centers. Turner points out that computers

rival traditional library materials for the storage and dissemination of information often are not located in libraries. Users have access to a wide array of information sources besides the library. Library personnel need to take part in the planning process of computer use.[102] The situation described below at Columbia University takes this one logical step further.

Patricia M. Battin believes the "Librarians don't organize books, they organize knowledge and ways to gain access to that knowledge." She believes that librarians have become expert at organizing and gaining access to information stored on computers. At Columbia University she is one of the few people in higher education to be both a librarian and an academic-computing chief and is in charge of all scholarly information, no matter how it is stored or disseminated.[103] Given the array of all types of computers, microcomputers, etc. typically found in most academic libraries and the access to hundreds of databases, the library as a "Scholarly Information Center" (a concept rather than a place) provides the information scholars need to support their work, no matter what the format or how it is stored.

Growing numbers of individuals believe that optical storage is the major promise of the future in libraries. Information previously available only in reference books or available only via intermediaries can now be available without these constraints. Carney (from Information Access Co.) offers criteria which must be met for potential use of optical storage in the reference environment. 1) Sufficient demand for the data published to justify

purchase, 2) microcomputer software easy enough to use so that data can be accessed by patrons, 3) fixed costs to allow budgeting for reference services. The author points to Infotrac (a core database of about 900 periodicals, updated monthly) as an example of this technology using laser disks.[104]

The same Compact Disk (CD) technology that has created a revolution in the stereo/audio recording industry is being used to store large amounts of digital data. A CD player interfaces with a personal computer. Herther provides a detailed analysis of CD ROM (compact disc-read only memory) technology and notes that this approach "has proven it has the capacity to provide high quality, low cost, mass data storage and reasonable fast retrieval. Eventual success, however, will depend on: 1) the success of CD ROM to penetrate its targeted vertical markets of education, libraries and database applications; 2) user acceptance of the mediums; and 3) yet unknown, future technological developments and changes . . ."[105]

This technology should have major impacts on reference service. Online searching is typically done under pressure, i.e. with the meter running and costs accruing. The new tools based on optical information systems (CD-ROM, digital videodiscs, laser cards, etc.) can potentially create a more relaxed atmosphere for database searching. Libraries can subscribe to CD-ROM databases and receive disks on a regular bases for searching on microcomputers equipped with a CD-ROM reader. Online charges, telecommunication charges, the need for special passwords, etc. become a thing of the past. There are no limits to the number of interactive Boolean operator searches that can be conducted. Tenopir notes that "the CD-ROM capacity is

equivalent to 200,000 single-spaced pages or 46 days worth of continuous data transmission at 1200 band, the entire Encyclopedia fits on one compact disc."[106] She carefully examines the advantages of databases in this format such as durability, inability to be altered, etc. Examples are many. Psychological Abstracts Information Services (actually PsycINFO and SilverPlatter Information Services) are planning the development of PsycLIT on CD-ROM. Materials from Psychological Abstracts cumulated since 1974 will be available for $5000 (including quarterly updates and retrieval software). Prices do change and the direction as of early 1987 appears downward. LISA (Library & Information Science Abstracts) will be available on SilverPlatter compact laser disc. PAIS International will be available in via the same approach. Ingram Book Co.'s Laser Search offers access to 1,500,000 English language titles using laser Compact-Disc technology for book identification and acquisitions. General Research Corporation offers 4 million MARC records on their LASERQUEST system. H.W. Wilson is exploring the feasibility of Wilson Files on disk, perhaps using a CD-ROM player and IBM PC xt.[107] This list can go on and on. Tenopir notes many others.[108]

One potential problem mentioned throughout the early CD-ROM literature is that of standardization. The Information Industry Association Standards Committee desires "early development of a working standard which allows the functional interchangeability of media and drives." This will "avoid the necessity of multiple disc mastering and redundant data preparation to function within different system environments. Similarly, users may acquire CD-ROM drives and

workstations with confidence that many, if not all, of the discs becoming available would be readable on that one system."[109]

Taken together, the potential for CD-ROM, end-user searching and other microcomputer applications available to patrons will have major impacts on future space planning in reference. Perhaps these functions will become part of a separate area away from traditional reference services. On the other hand, perhaps some of these services will be offered adjacent to reference areas. Perhaps patron access terminals will be placed all over the library building. Micro-based workstations may need to be located in many areas. Specific types of power supplies, lighting requirements, tables, carrells, etc. might have to be considered. A library being planned now might need to be more flexible, however such flexibility is expensive. Renovation of existing conditions to fit new technologies would be even more costly. Suffice it to say that the ramifications of new technologies and services go beyond just a change in format. Implications reverberate throughout the whole library system.

As difficult as it is to predict the very near future, it is even far more of a challenge, if not pure guesswork, to attempt a scenario of reference services quite a few years down the road. Although it is extremely exciting to be working in an area where technological developments are exploding around us, it is less exciting and more frustrating to attempt to write about it. By the time a paper is published, new technologies and innovations can be old hat. Directions that seem obvious may never come to fruition, e.g. the CD-ROM tools exploding on the scene as the chapter is being

written may be potentially to expensive or may not be produced in adequate frequency to really "take off" in the market place.

One trend that may take hold is the concept of a one-stop-shopping-center where an array of information can be available in the library at one terminal location. OCLC'S UNISON system will provide access to a half-dozen or more of the online vendors in addition to the vast OCLC database using an OCLC terminal. Also, the future might allow patrons to move from a search of a local catalog to a search of other libraries and then to a system "that allows patrons to borrow materials from other libraries through user-friendly interlibrary loan commands."[110] Santosuosso goes further in his analysis of the library as a gateway to online services.[111] Online public catalogs and online reference services developed in different directions because the automation of each function merely augmented an existing manual system. Also the two systems were designed for different sets of users. Online catalogs were designed to be used with little assistance whereas online searching required an intermediary.

Santosuosso recommends a convergence between these online catalogs and online reference and notes many ways in which this can occur. He recommends a system he is involved with at CL Systems, Inc. called DataLink or similar systems which should come to the forefront. With this system "a patron may examine the library's holdings and the circulation status of items in the online catalog, then using DataLink, dial out to one or more reference databases. The reference databases may consist of another library's online public catalog which could be checked for holdings, an online

periodical index or a user-friendly front-end service which could formulate and execute a search for the user in multiple databases, including full text databases."[112] All of this searching is from a single terminal and can even be from a remote location using dial-in access. Using systems such as DataLink libraries can "increase access to electronic information, integrate the online catalog with online reference services, and optionally provide a means to track and recoup costs."[113] This type of intersystems communication module available through a library's public catalog allows a library to offer both dial-in or in-house access to electronic information, thus keeping the library in the forefront of both service to the users and also involvement "with producers and distributors in helping to define the products that are available in the information market place."[114] Santosuosso concludes "as libraries move towards the gateway model of information service, librarians will become more actively involved in evaluating, designing and teaching use of information retrieval systems. The traditional role for librarians, as evaluators-advisors-teachers, will be carried forward to the electronic information centers of the future."[115]

Another scenario by Fayen looks at librarians as they turn into database managers. Database managers are "expected to provide information that can be used to directly support management decision making. The database manager must provide answers --- or at least well-massaged data --- that decision makers can use to guide their actions."[116] A librarian of today might say "here are references to a bunch of sources which may help in your research." A database manager would never get away with this and "has certain

responsibilities that librarians have been unwilling to assume in the past . . . the information the database manager provides had better be right."[117] The librarian of the future "must be prepared to take on the responsibility of providing real information and vouching for its correctness with their professional credentials."[118] Fayen believes that "we are at a point of change, brought on for the most part by technology. With change comes a rare opportunity. We have a chance now to redefine what we do, to provide what our users want, and to have our services valued at their true worth. We must not sell ourselves short. The future of libraries may depend on it."[119] Butler says it differently. "No library would want to experience the growth rate of an Apple Computer, but you need to try for a little more success than you think your library can handle. If librarians during the next two decades don't fight for success, libraries as institutions may well become 'the living dead,' the background music of the information world."[120]

There are even more radical scenarios on the horizon. Gerber believes that "by the year 2010, nearly 60 percent of librarians will be self-employed or will work out of libraries under contract to small businesses."[121] A more detailed and intriguing scenario by Surprenant and Perry-Holmes depicts reference librarians as "information specialists," a vast majority of which will be in "service-point offices, outside of the library, where they can be close to the action in their user community . . . (These may parallel Fayen's "database managers.") Another class of itinerant reference librarians will go directly to their clientele, since many of the information problems of the future will be locally based and need

expert assistance on site."[122] The authors see accountability and an individual entrepreneur system in that "the greater the expertise and level of assistance provided, the higher the salary."[123] They also perceive that "Continuing education will become so important that it will be a totally separate task undertaken by librarians who are authorities in teaching,"[124] the BI librarians of the future. Surprenant and Perry-Holmes, in a fashion similar to previously mentioned articles, call for librarians to accept innovation, be willing to experiment, be self confident in our abilities, potential, and conviction to lead.

Libraries have a choice of keeping up with the computer revolution or become a vehicle for storage, i.e. simply a collection of books. In most cases they probably will maintain their archival responsibilities for the foreseeable future with ever increasing injections of online access and other new technologies. Libraries and universities throughout the country are at various stages of automation. Some libraries have not yet even ventured into online database searching. Others maintain banks of microcomputers for end-user searching. Some universities have few computer applications for instructional purposes, others are well on the way towards routine online access to library and other materials from work stations throughout the campus. Some libraries and universities are planning for logical change, others just reacting to pressures. Often the funding levels are a major determinant concerning the speed and effectiveness of automation endeavors. Schools that can afford it offer more free access to information, others experiencing budgetary constraints cannot. (This parallels the many individuals

with money benefiting from home microcomputers while others still cannot afford what they perceive is a distant luxury.)

Being in the mainstream of library service, reference services will be tremendously impacted by automation and electronic endeavors such as electronic mail, speed of transferring information for ILL, networking, conferencing, electronic transmission of online search results (DIALOG's "Dialmail" already does this), providing reference aid for individuals desiring to borrow software, use of full-text periodical reference databases, coping with end-user demands, providing support for the microcomputer users, effectively using the potentials of optical storage, etc. This is an explosive, expensive, and exciting time for reference services. There are many difficult choice to be made. Yet, as exciting as it is for some, it is potentially frustrating for others who are out of the mainstream or without the resources to pursue the available technology.

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